

# INDUSTRIAL-ARTS MAGAZINE

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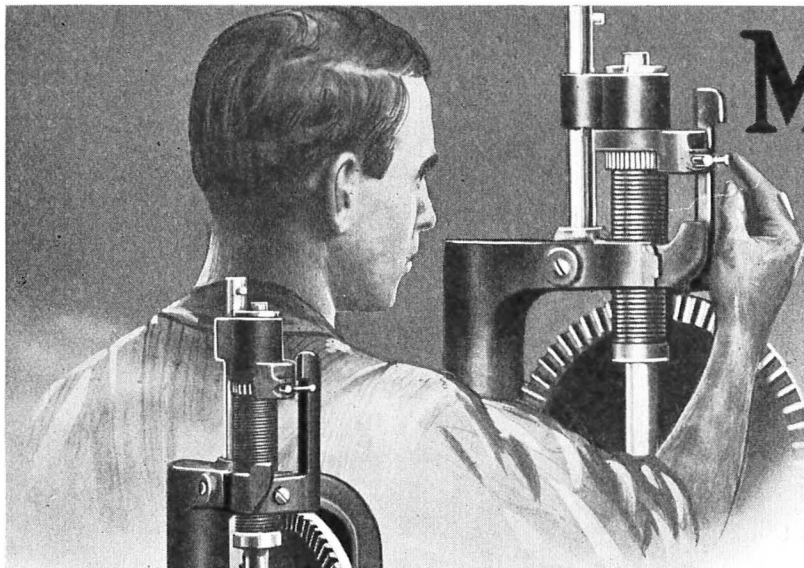
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## The Relation of Industrial Needs to Evening Trade Schools

Chester Lawrence Pepper, Agent of the Massachusetts State Board of Education  
in Charge of Industrial Education



THE world war is testing the strength of our industrial and educational systems as they never have been tested before. In the struggle for an ever increasing efficiency both systems have located weak points in their organization; both systems are also devising methods to improve and strengthen those weak points.

Happily, every effort to strengthen the organization of the personnel of industry brings the systems of vocational education into closer and more accurate co-ordination. In the solution of their common problem, namely, the training of workers in industry to a higher efficiency, vocational educators and employment managers are working, and must continue to work, in closer co-operation and understanding.

In recent years, for the first time, industry is making vigorous, definite, and concerted efforts to cut down the tremendous waste due to excessive labor turn-over or, in other words, the unnecessary "hiring and firing" of employees. Industrial establishments all over the country are placing at work expert employment managers, in an effort to increase the efficiency and trade standards of their employees.

Significant is the fact that, as soon as a systematic study of employment problems is undertaken, two factors are at once distinguished; the first, promotion of the employees from within the ranks; and the second, establishment of a system of trade training to enable promotions to be made more rapidly and satisfactorily.

In view of the need for a closer understanding of the problems of establishing voluntary co-operative trade training, a brief outline of the elements which have retarded such training in the past is needed.

The old apprenticeship system has failed. Only a few of the large and more independent concerns carry on a well organized system of apprentice training. Generally speaking, the average small manufacturer is, at the very start, more or less bitter in his attitude toward training apprentices. He reasons that to conduct any efficient trade training of apprentices will cost the concern, undertaking the work, a considerable amount of money. The expenditure will increase in direct proportion to the efficiency of instruction. Accordingly, if one manufacturer conducts an efficient trade training proposition at considerable expense to himself, and a rival concern is operating without any expense of training, then

naturally, other things being equal, the rival concern is in a better financial position to compete for the services of the trained apprentices. Altho manufacturers instil into apprentices a sense of loyalty to the concern and moral obligation to a long and faithful service in the employ of the concern which trained him, nevertheless, if a rival manufacturer can and will offer him more money, nine times out of ten, the apprentice will leave. Thus, manufacturers claim that just as soon as they have carefully finished the training of an employee, a rival concern "steals him."

Accordingly, an employer must, in self defense, cut down the cost of training to a minimum. To do this, he must exploit the apprentice to such an extent that the cost of training is fully covered and when the training is completed, he is placed in a financial position to compete on an even basis for the apprentice's service.

This exploitation has generally taken the form of keeping a man or boy upon types of work long after the instruction value has ceased. In other words, an apprentice may learn how to do a job with full journeyman's speed in a few hours and yet be kept at work upon this job for days at a time. The manufacturer, of course, has received for the apprentice's services, full journeyman's production at the low apprentice wage and this profit offsets the loss due to the initial training period.

With the decline of the apprenticeship system, specialization sprang into existence. Men could be trained in a few days to do some particular job and were kept upon that one job indefinitely, no steps being taken to give an all around training. This system worked satisfactorily while help was plentiful and large numbers of all around skilled men, trained under the old apprenticeship plan, could be secured.

Now, however, the tide is beginning to turn. Unprecedented demands for skilled labor have caused wide gaps in the ranks of the factory personnel. Great difficulty has been experienced in substituting specialists from one branch into another where a critical shortage of skilled labor exists. Specialization has dulled and narrowed the operator if we compare him with the all around skilled worker. Manufacturers are now convinced that a considerable body of all around mechanics must be available to supplement the groups of specialists.

Specialization has come to stay, however, and where "green" men are hired they will first be trained as specialists. The specialist is at a disadvantage, of course, due to the fact that he can be more readily replaced and consequently when work is slack, he is the first to be dropped from the payroll. The all around men can be transferred readily to another type of work that is in demand and thus is less likely to be released. Nothing is so demoralizing to a man's character as frequent periods of unemployment. Home development cannot thrive under such conditions. Accordingly, specialists should be given an opportunity to develop skill in other lines that will enable them to supplement their work during business depressions.

Labor, at present, is scarce. Manufacturers realize this shortage only too well. The lack of skilled labor will also in all probability continue indefinitely after the war. Immigration has decreased tremendously and probably will not increase materially for a long time to come. If foreign countries are to recuperate from the effects of the world war they must get their gold back in return for goods they manufacture. Accordingly, they must retain all their skilled workers. Wages abroad in the future will probably compare favorably with those in the United States. This factor in itself will tend to reduce immigration to a minimum.

Thus, American employers realize that their factories must be operated with help that is now available and if it is poorly trained then their problem will be to train these employees to a high state of efficiency, in the shortest possible time. In other words, a high production efficiency with a small number of well paid employees must compare favorably with the efficiency of large numbers of poorly trained and unskilled immigrants working at low wages. If this high productive efficiency is to be attained, then adequate trade training facilities must be provided.

Competition for labor among employers has now become so keen that the labor turnover has been doubled and tripled. When we realize that for every man kept steadily on a job, it is commonly necessary to hire two or more men and to train each man generally costs from \$50 to \$150, then the total burden of cost in a large establishment can easily be estimated.

Now, to keep a man steadily upon a job, he must be satisfied with his working conditions; he must be given an adequate wage and facilities within his reach for promotion and advancement. Progressive employment managers in their struggle to cut down excessive labor turnover have found that promotion from the ranks is one of the surest ways to prove to employees that recognition is given for faithful and satisfactory service. Every employee must receive a more or less regular increase in wages for increased efficiency. The fundamental restlessness

of human nature for a change in environment will cause excessive labor turnover if an incentive for continuous service is not always present. Wage systems are now being worked out in many industries, classifying all employees into a series of groups according to their skill. Each group has a standard wage rate according to the degree of skill required in the respective group classification. Promotion and wage advancement is secured thru successive ratings in high group classifications, as an employee's skill and efficiency develops. Naturally, to accompany this type of wage system, there must be a thoro and equitable system of examination and training for promotion. All employees could be hired thru a training school, and at regular periods opportunities should be offered employees to take examinations for a higher rating. If such training facilities were conducted solely under the control of either industry or labor, each might easily become suspicious of the motives of the other and consequently a fertile field for dispute would exist. The training facilities, accordingly, should be supervised by an impartial agency, whose sole guiding purpose would be to insure the most thoro, just, and efficient plan of trade training. No better agency expert in this field of work can be found than in the public school authorities. Labor is in hearty sympathy with trade training propositions conducted under the supervision of such authority, because it has the confidence of both labor and employers alike. The chief fear of labor is that trade training facilities will cause a flooded labor market and subsequent unemployment. The public school authorities have long realized that to train more men than industry can absorb is an injustice to labor as well as to industry and consequently every endeavor is made by educational authorities to gauge conservatively the absorbing power of any industry in which trade training plans are undertaken. The fear of flooding the labor market by any vocational educational system under control of the public-school authorities is absolutely without foundation.

In making provision for trade training in a given community, clearly, the first endeavor should be to bring those already engaged in a trade to the highest possible state of efficiency in that trade, before training new recruits. Efficient employment management demands that men already in service be given the first opportunity to take advantage of training facilities so that they may always be in a position to maintain their lead toward the road to success.

Trade extension evening schools are, at present, one of the chief factors contributing to advancement in trade efficiency. The number of evening schools in operation, however, is pitifully inadequate to meet the demand in many localities. Altho school authorities and citizens may wish to establish evening trade extension schools for the further advancement of men already engaged in the trade for which the courses of instruction are offered, nevertheless, serious dif-

ficulties tend to check their endeavors. In the machinist's trade, for example, it is practically impossible, due to the demand for tools by war industries, to purchase enough machine tools to establish a school shop even if the community could raise sufficient funds to procure them. The cost of maintaining the shop, considering the high cost of operation, is another forbidding feature. In fact, at the present time, it is practically impossible to establish and equip a new evening industrial school if expensive machinery must be purchased for satisfactory operation.

Accordingly, let our attention be turned to the situation in the manufacturing industries. The elements, bearing upon the need for trade training by industry, have been previously outlined. Almost any manufacturing establishment, whose machinery is not in operation at night, would be willing to co-operate with the public school authorities in furnishing facilities for trade extension instruction in the evening if satisfactory arrangements could possibly be made.

For the sake of a clear illustration, let us consider some of the necessary steps needed to establish an evening trade-extension course in advanced machine shop practice for men engaged in the machinist's trade. First, let the public school authorities interview one or more of the most modern and progressive machine shops in the community, which may not be running nights and which can carry on a wide range of productive work on standard machine tools. The management will probably agree to furnish light, heat, and power for two hours per night, two nights each week, under an arrangement similar to the following:

1. A properly qualified instructor must be placed in charge of the school. This instructor must be solely responsible to the school authorities for efficiency of instruction.

2. The factory management will furnish free of charge, light, heat, power, use of tools, and equipment, providing the instruction and practice work is given upon types of work selected by the instructor from the regular lines of factory production. It is estimated that the value of the productive work

turned out will about cover the cost of operating the shop during the night sessions.

3. The instructor must be familiar with the routing of the factory production so that no delays in the day operation of the plant would result from the night construction work. The evening work should supplement the day production as far as the instructional value of the work will allow. One of the factory superintendents or foremen would generally make a very satisfactory instructor due to his intimate knowledge of the shop production and manufacturing facilities.

4. No reduction of the amount of labor employed in the plant during the day time should be allowed as a result of the productive work done in the evening school.

5. The courses of instruction should be open only to those men already engaged in the machinist's trade. These evening courses must not be designed to teach "green men" the machinist's trade, but only to develop men already employed as machinists to a higher state of efficiency.

6. The courses must be open free of charge to all machinists in the community. No payment of wages is made during the evening school session.

7. The instructor's salary must be paid entirely by the public school authorities, together with any school supplies that cannot ordinarily be secured from the factory stock rooms.

8. The co-operating factory must not interfere in any way, direct or indirect, with the pupils attending the school, who are employed by outside concerns. In other words, the co-operating factory must not allow the charge of "stealing workmen" to be ever justly charged against it.

If an agreement such as above outlined can be arranged it will form the basis for the establishment of some very efficient evening school instruction, a type of instruction most urgently needed at the present time. Accordingly, let us all, educators, employers and labor, each one, contribute his maximum efforts in good faith to the cause of developing the highest possible ideals of knowledge and skill in our great working population.

**I** DO not propose to stop the wheels of enterprise, but only to have them spin more merrily and more sanely. The work of the world would get done easily enough, even if life were an unending holiday, that is, all the work that is worth doing, for, rightly handled, work is the greatest fun of all the fun that is: only you must bring to it good health and high spirit and a love for the beautiful; and the work itself must be worthy, not cheap and nasty stuff, unnecessary toil that one can take no interest in, but sturdy, honest, manly work that you can put your heart into, and do because you have chosen to do it, and would rather do just that particular thing than anything else in the whole round world.

—C. Hanford Henderson.



# Art Metal Work: A Course in Manual Training

L. D. Perry, Supervisor Manual Training, Joliet, Ill.



HERE appears to be a diversity of opinion concerning the value of art metal work in manual training courses. It is claimed by many that it lacks the various elements which go to make up an all-around course, as well balanced and organized as bench work in wood for example, and that it lacks content value. A certain university not many years ago eliminated art metal work from its teachers' training course in industrial arts. This course there had become well systematized. The enrollment was as great as in companion courses in bookbinding, woodwork and construction work. The salient reason for eliminating this course appeared to be that those in authority concluded that it had little value as a hand-work medium of expression and of little value in mental training and discipline. If these are conclusions they are based upon false premises and are reached without due and serious regard to the actual practical and educational value of the subject. And certainly they were reached by persons who had had limited or no experience in the teaching of art metal work.

In common with a majority of manual arts subjects art metal work may be made rich in content, broad in its application, in direct ratio to the amount of energy and thought given to the organization of the subject matter. Any course will languish if interest in it is not manifested and if men and women with a good working knowledge of the subject are not employed to teach it. And if those who may criticize adversely certain manual arts courses would put as much time and patience on constructive criticism we would soon arrive at well rounded, perfected courses; an end desirable, but which by their very methods they are making difficult of attainment. Snap, unjustifiable judgment upon manual art courses by individuals not conversant with the technical aspects of the work cannot be too strenuously condemned. We are working toward a common end,—the technical and academic men,—and we can best serve each other's interest by a mutual respect for all courses.

Art metal work, as its name implies, is a subject in which the art element of the medium is emphasized. The materials for expression are commonly copper, brass and silver. It permits the use of a great variety of tools and adds processes in tool work which cannot be had in woodworking alone. It is an invaluable means of art expression and perhaps leads other courses in manual arts in this regard. There can be no question but what pupils in the elementary schools need a variety of organized experiences. Woodwork is not sufficient. Art metal work is a subject which deserves serious consideration. The processes are relatively

simple; the medium is no more difficult to handle than wood; designing for a purpose is possible; and its relation to certain sciences makes it a most commendable educational medium.

## Methods of Working.

Many new processes are introduced in art metal work. These processes are in most cases not comparable to those in other branches of the manual arts. Such work as etching, sawing, raising, riveting, soldering, planishing, is new to the pupil; it is not met with generally in other courses. These processes are relatively easy of manipulation. The methods of working are thoroly discussed in several very commendable books on the market, and consequently no elaboration need be made in this article. The particular purpose of this article is two-fold: to make a plea for art metal work in the elementary schools (not overlooking the high school), and to suggest a possible course covering a semester of work. The semester considered is sixteen weeks in length, of half-day periods once a week. With regard to the first object the writer wishes to suggest that he has had ten years' experience in teaching and supervising art metal work. He has had liberal opportunities of testing its value from every angle, and the conclusion reached is that it should be introduced in the elementary schools in the seventh grade. It may be well adapted to boys of this grade; it may be made rich in content here; and it is fundamentally as important as other shopwork generally conceded to belong in the elementary schools. With regard to the second object, the course is outlined in such a manner as to allow liberal variety of processes and problems. Sufficient time is allowed each problem that the pupil may understand all operations and become relatively dextrous in manipulation of tools and processes.

## Correlation With Design.

Very few courses in the manual arts permit of a closer relation with art, considered as a subject, than does art metal work. The opportunities for the making of serviceable, beautiful objects in copper, brass and silver are practically limitless. And here the drawing classes find that their work has a practical application in worth while articles. No difficulty need be experienced in working out in the classroom designs for use in the metal shop. Because of this correlation the classes evince considerable interest and they recognize, as they may not in any other way, the limits of the medium, with the result that better drawings are produced. Art courses are too generally made up of meaningless lines on paper; the end of the course finds a portfolio well filled with commendable designs, drawings, etc., but of no value except that which naturally results from any work on which the individual spends time. This comment

may be cant but it nevertheless depicts conditions in hundreds of systems; even in systems where opportunity for correlation exists. Art metal work offers a simple and logical outlet for the products of the drawing class.

Inasmuch as art metal work is so closely related to design some consideration must be given to the subject. Here a poorly proportioned article is valueless, and design improperly worked out impossible of execution. We have come to accept certain standards by which a design may be judged. It must be suited to the function of the article; the design must not weaken the structure planned; it must

be needed in metal work they are then ready in the drawing room. And not the least consideration is the establishing of a working plan between two interdependent departments.

#### The Course of Study.

Classes of fifteen pupils may properly be considered the maximum for art metal work. It is practically impossible to efficiently or even adequately teach a larger number. Too much detail work and individual attention is necessary to admit of larger classes. It is comparable to classes in printing in this particular.

The group method is the best method of instruc-

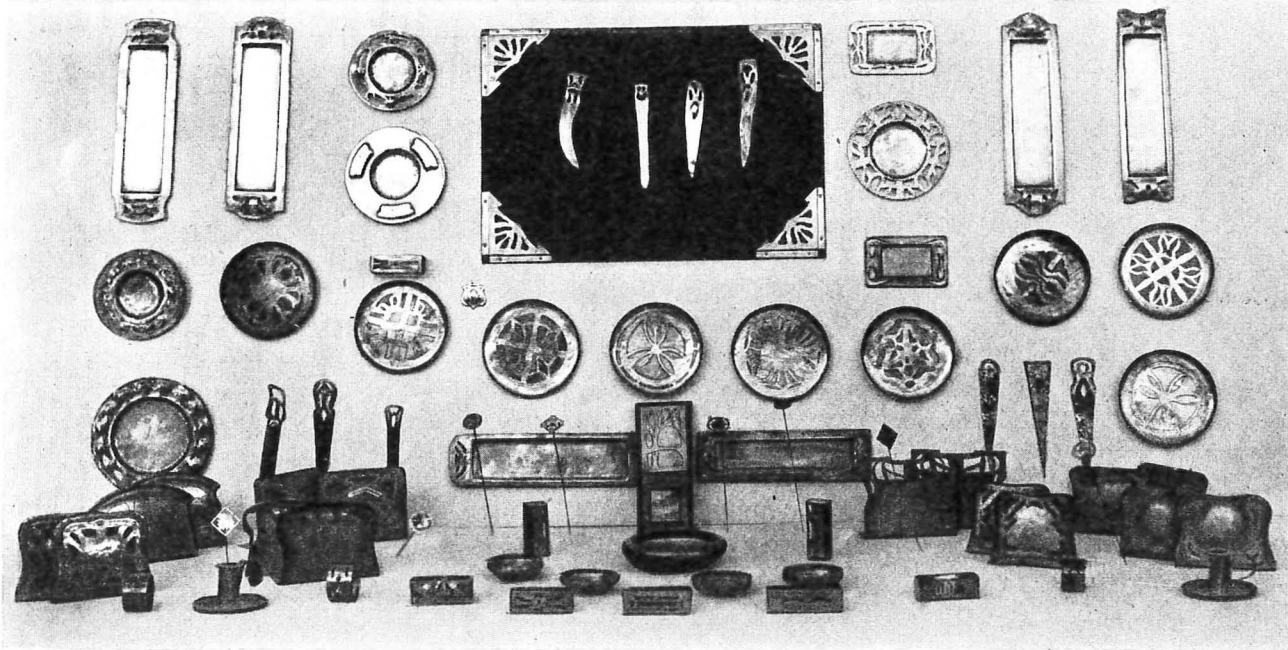


PLATE I. ARTICLES MADE BY GRADE BOYS AND GIRLS IN THE ROCKFORD SCHOOLS.

be capable of execution in the manner planned; the applied design must appear to be an inherent part of the structure; and the limits of the design must be recognized.

Too much emphasis may be given to rules and formulas for the execution of design, yet some principles are necessary to guide the pupil in producing generally acceptable work. He is definitely limited by his medium and he early recognizes the fact that a design planned and executed for etching may not be suited at all in saw piercing. Designing is a subject which must be approached in a definite manner and the pupil should be able to recognize why a design is good, and why another poor. Design belongs inherently with art metal work. Eliminate design and metal work is eliminated.

The outlined course in metal work in a large system should be presented to the art director at the beginning of the school term. In this outline full explanation of the technical requirements needs to be incorporated. The director may then include these problems in the course in design, planned to run concurrently with the metal course. As designs

tion; each boy making a similar article. However, great latitude should be allowed in the outline of the articles, in the construction, and in the constructive and decorative designing. The spirit of imitation is rife in the average class in manual training and duplication of designs is a common fault. Each boy needs encouragement in designing the type problems that they may show individuality and a certain spontaneity. These elements are not found in articles which have been copied or slightly modified.

The following course outlined has been planned with a view to allowing the classes certain latitude in their work. They aim at definite variety in processes and experiences. The problems are in the order given in the course and are sequentially arranged. Each succeeding problem involves more difficult operations than the one before. The first group of problems requires a semester of time in execution if properly worked out with attendant talks and demonstrations. The second group, called alternate course, may be given for the sake of variety to a second class. The processes in both groups are practically identical. The third group is suggestive

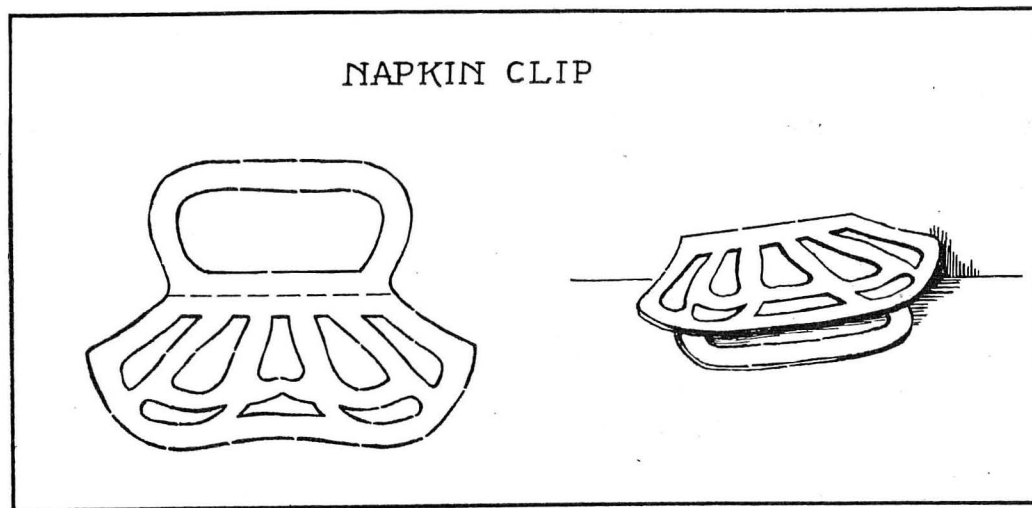


FIG. 1.

only. It is not sequentially arranged but indicates good types of problems for advanced pupils. It should be obvious that a number of courses may be planned involving parallel arrangement; those indicated are given because they have been successfully followed.

*A Course.*

1. Napkin Clip—Involving sawing and folding.
2. Napkin Holder—Sawing and hard soldering.
3. Card Tray—Edges raised over stake and tray etched.
4. Ash Tray—With center depressed over sand bag or form. Sawed edges.
5. Sconce—Planishing and riveting.

*Alternate Course.*

1. Letter Opener—Saw piercing. Use of pattern.
2. Napkin Ring—Sawing and hard soldering.
3. Pencil Tray—Depressing. Sawed design.
4. Match Safe—Etched plaque. Pattern making. Folding.
5. Bud Holder—Bending. Planishing. Riveting.

*For Advanced Pupils.*

1. Book Ends—Saw piercing. Applique work. Riveting.

2. Table Lamp—Correlated with woodwork. Wiring. Glass setting. Bending. Sawing and riveting.

3. Desk Set—Involving a number of operations.

4. Jewelry—Making of stick pins, fobs, and hat pins.

5. Candlesticks—Hard soldering and riveting.

6. Bowl Making—A difficult problem, yet one commendable for interested, capable pupils.

It is good practice to vary the courses from year to year, yet keeping the same sequence, and allowing for gradual development. This plan will keep the work new and interesting to the instructor and will permit of initiative on the part of the pupil. Both pupil and teacher benefit from such procedure.

*The Illustrations.*

In discussing the drawings and photographs the assumption is made that the reader is more or less familiar with art metal work. Those interested and unfamiliar with the medium will find full discussion of tools and processes in books on the subject. This because no attempt has been made to discuss these things in any more than a general way. The drawings

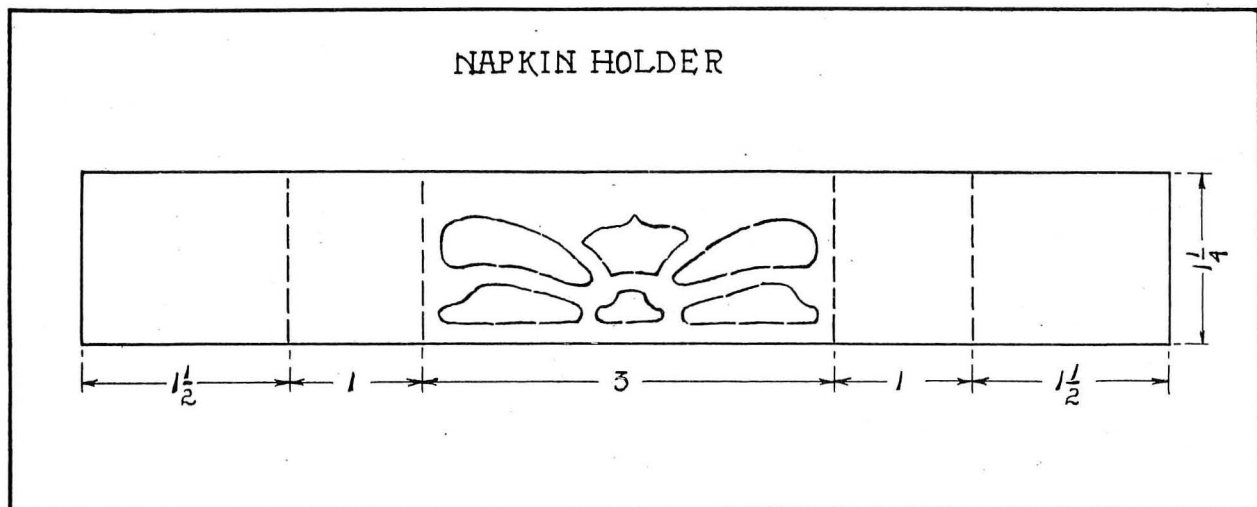


FIG. 2.



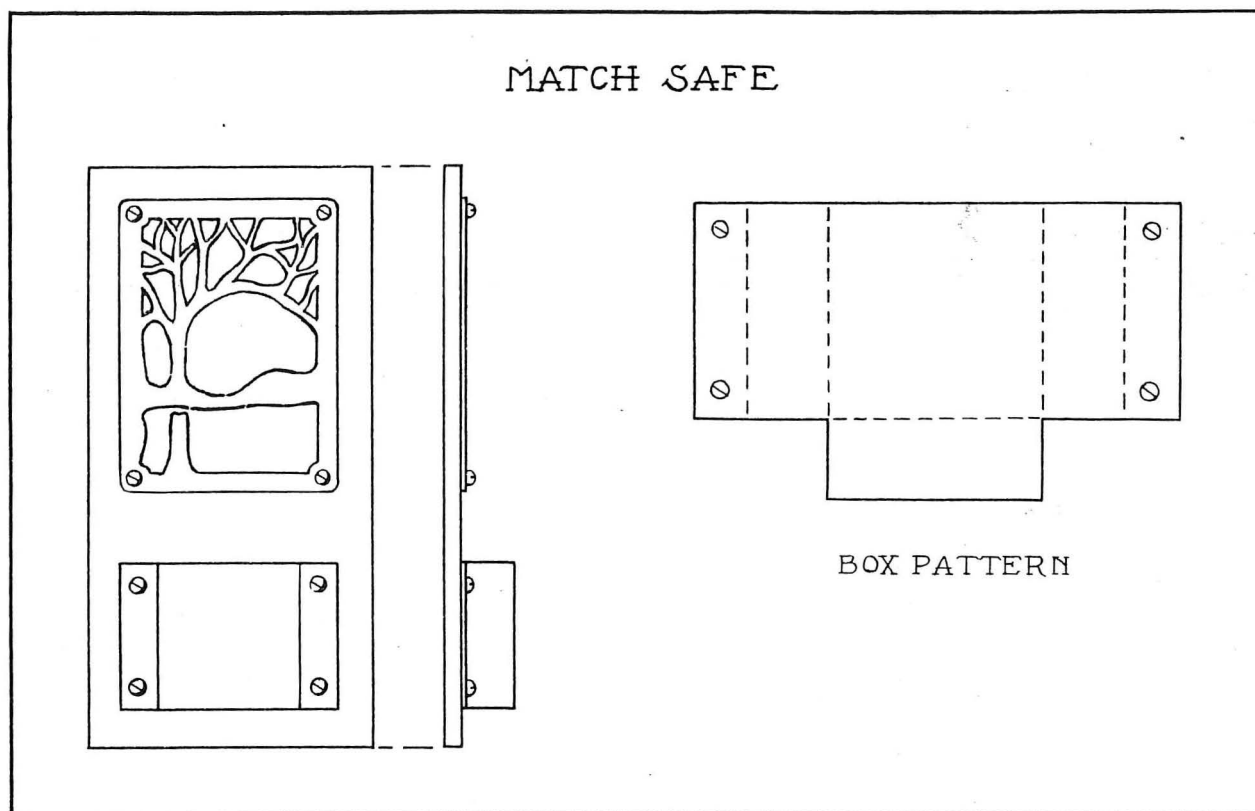


FIG. 3.

are for the purpose of showing in some detail the method of working out the problems with classes and to clarify in a typical manner the development of the given problem.

Figure 1 shows the pattern and design full size, and a reduced perspective sketch of a napkin clip. The dotted line on the pattern indicates the place for the bend. The clip may be varied in size to suit different sizes of napkins and the individual taste. In many instances the design will permit of raising the surface. Planishing also lends variety to the problem.

Figure 2 shows the pattern of a napkin holder with applied design. This holder may be varied to a considerable degree by applying design to the ends and changing the outline of the entire holder. The

hard soldering is a simple operation if a gas blow torch is a part of the equipment. Eighth-grade pupils have for years worked out this problem and the soldering has been by no means the most difficult operation in connection with it. Plate 1 shows several holders and rings. To vary these shapes is simple and interesting. This plate, with the others shown, indicate representative problems made in a year's time by several classes. It will be noted that sufficient variety and latitude exists to satisfy the most discriminating taste. Yet not a problem represents work without the province of the seventh or eighth-grade boy. They have all been made by elementary school pupils.

Figure 3 shows a working drawing for a match safe, with attendant pattern for the box. Several operations of a distinct nature are involved here; one connects directly with woodwork. The plaque is etched. The pattern for the box is drawn on the metal, cut at the full lines and bent at the dotted lines. Holes are bored at the proper places and the plaque and box fastened to the back with round head copper plated brass screws. A small piece of emery cloth may be glued to the wood immediately above the box, or the plaque may be used for the match strike. Semi-conventional designs of the kind shown on the drawing lend themselves pleasingly to etching on problems

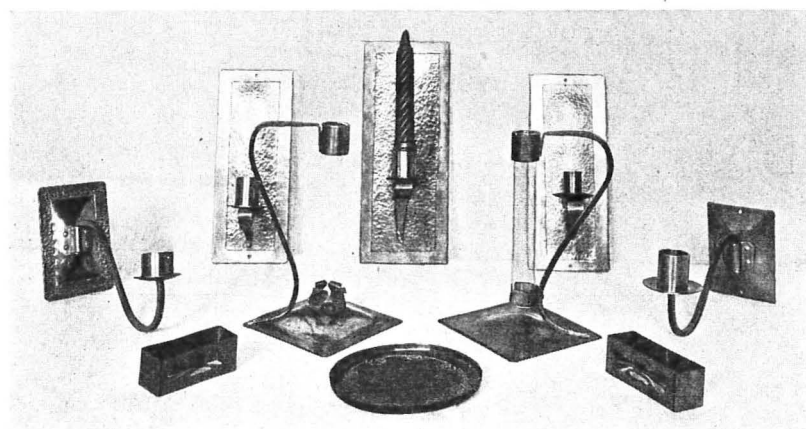


Plate 2. Candle Holders Trays, etc., made by the Author's Students.

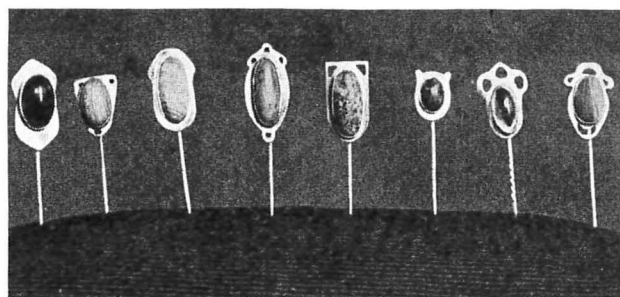


Plate 3. Stick Pins.

of this type and are easy to manipulate in the shop. No size is indicated for this problem for the reason that proportion of art metal problems, or constructive design, is an essential part of the training of the pupil. Many modifications are possible, limited only by the resourcefulness of the pupil and instructor.

Figure 4 shows full size sketches of pins shown in the photograph, Plate 3. They represent work of seventh-grade boys and were given as a special problem. The designs are admittedly simple, but considerable work is demanded in soldering the bezel and setting the stone. The stones are, with one or two exceptions, found locally, cut and polished commercially.

Plate 4 shows a setting for a table lamp, applique book ends, bowl and candlesticks. These candlesticks are made of copper tubing, a flange soldered at the top and the tube soldered to the base. The handle on these and on the bud holders and wall brackets shown in Plate 2 are made from quarter-inch copper squares. Squares, rounds and tubing may be procured on the market.

#### Equipment.

A few special tools not found in art metal shops generally are foot power shearer and bending machine. Each machine represents an item of twenty-five dollars but the efficient work that they do and their saving of straight manual labor more than offset the cost. Another item of importance is a well equipped acid table and sink. The top should be covered with sheet lead and the sink lined with the same material. Lead will stand the ravages of acids for a considerable period and is a wise investment altho rather expensive

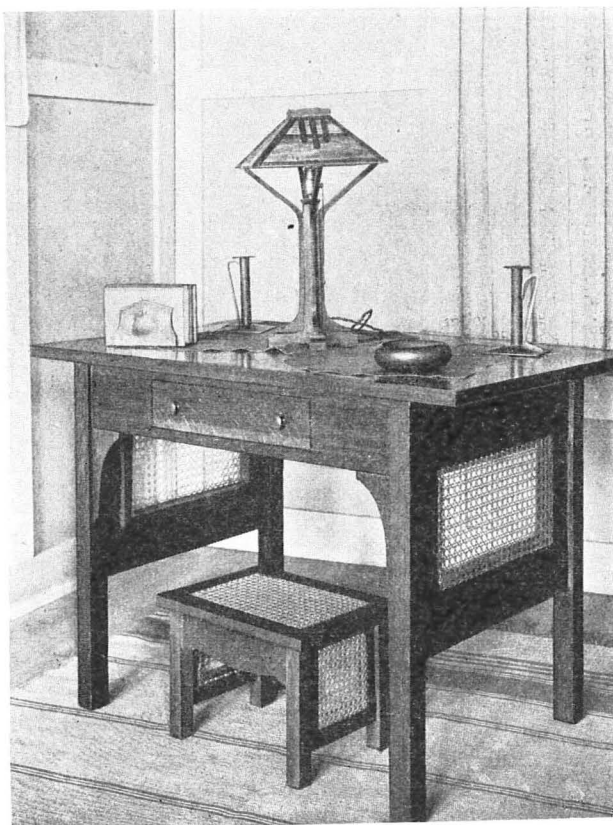


Plate 4. Table Lamp, Book Ends, Candlesticks and Bowl.

initially. Benches need to be heavy if much raised work and hammering is part of the course. Several heavy iron vises are indispensable. The many small tools and accessories are listed in several books and persons interested may easily plan an equipment.

There can be no justification for the practice which makes for the installation of "minimum" equipments. It cannot be too emphatically stated that minimum equipments are to be avoided. Liberal, necessary equipment with special tools and accessories are fundamental in handwork. Substitute tools and make-shifts for performing certain functions in shopwork, which properly belong to tools made for such operations, should not be used if efficiency is a consideration. The equipment should be adequate to carry on efficiently the work undertaken.

Much has been written about over equipping manual training shops, but it may be stated rather emphatically that the evil of under equipping is a pernicious one. With liberal allowance of tools we may get the greatest good and development out of our shops. And in art metal work the plan should be to fully provide tools and materials for the work undertaken.

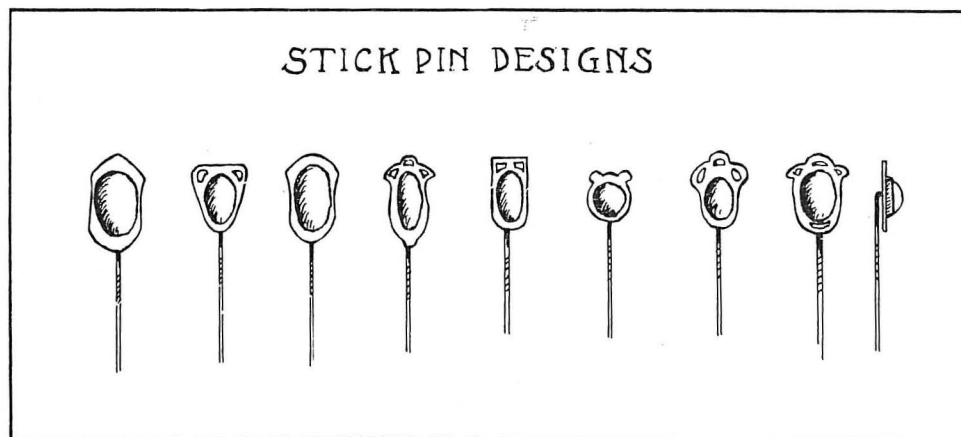


Fig. 4.

# A Plea for a Uniform Pedagogy of Manual Training

Charles A. King, State Normal School, Plymouth, New Hampshire



ANYONE attempting to write an article dealing with the manual arts in the broad is confronted with an assortment of names designed to distinguish between the various types of handwork and their aims. These may be reduced to two broad divisions, educational, the field of which is with students of grade school age, and vocational, which finds its most useful place among the younger students of the secondary school. The two terms allude to differences in aims, type of work done, and methods of presentation, rather than to any essential difference in the manipulation of materials.

Excepting among the teachers of manual training of a school system under a supervisor who can unify and standardize the work of the teachers for whom he is responsible, there is a wide difference in the ideals which vitalize the work of the teachers and the standards of attainment which each teacher considers he must compass. Even among the school systems there is the same lack of uniformity of aims and standards; it would seem that the time has come after more than a generation of trying out all sorts of ideas and visions, to endeavor to sift the accumulated mass of data to something resembling a standard which can be urged as being the best fitted for students of certain grades, and containing the most promise of potential educational and vocational efficiency.

Because of the absence of a definite and uniform conception of what constitutes a reasonable quantity of work from each student, an independent manual training teacher is in doubt as to whether he is accomplishing much or little. This "go-as-you-please" method permits the unattached teacher to try all sorts of pedagogical stunts, but leads to slight progress as compared to that which would be possible if there were uniformity of work grade for grade, that would permit the exchanging of pedagogical experiences. This would lead to the elimination of poor methods and the adoption of the most efficient methods of teaching handwork.

Such uniformity would not mean that every class of the same grade should make the same series of models, in fact if that were the case it would mean a sacrifice of the opportunity to develop the relations between the school and community; it would dispel interest, stifle the originality and initiative of the student, and reduce the percentage of educational efficiency more than would be gained by the adoption of a definite and universally applied but elastic pedagogy. Uniform methods should be applied only to the use of tools, the fundamental processes in the manipulation of the material, and in the adapting of their psychological and pedagogical relations to

children of different ages, stages of development and mental capacity.

The teaching of the scholastic subjects in the grade schools requires a teacher who has made a study of their pedagogy; her training has included the psychology of childhood, and the clever, conscientious teacher applies and improves her knowledge, having an almost inexhaustible supply of new ideas from the various teachers' magazines, because her subject is standardized, and the psychology and pedagogy carefully studied and applied by enthusiastic and experienced teachers. The same is true of all other subjects of the grade schools excepting the manual arts in which the unsupervised teacher is a law unto herself. Even in a well supervised school system the only criterion is the supervisor, and if the pupils do fairly good work and enough of it, the details of the methods employed are seldom criticised very severely. Despite all that has been said and written upon the subject the results of the course in manual training to the pupils are to a great degree still gauged by the excellence of the finished model.

The scholastic subjects of the grade-school curriculum regardless of the textbook used, are so standardized that it is practically the same grade for grade in nearly all parts of the country; this makes possible a great deal of professional literature dealing with the work of each grade, and allows the ambitious teacher to become familiar with the methods by which educational science is applied by other teachers. New methods which have been found efficient impel the conscientious teacher to improve her work, but the actual pedagogy of the manual arts has been treated in the same detail as the other subjects of the grades. Numerous valuable articles dealing with the broader aspects of pedagogy as applied to the manual arts have appeared, but they do not satisfy the demand for detailed descriptions of tried and proved methods.

Even tho there has been a gradual settling of opinions that certain kinds of material are adaptable to certain grades, the literature of the subject has been of the nature of outlines of courses, models and motives for work, rather than the pedagogical methods best suited to presenting the project to the students, and obtaining the maximum benefit from each piece of work in all its relations to the child. The idea seems rather to have been the accomplishment of a certain model or project in a given length of time, instead of teaching all that is possible to the child of everything which has to do with the model. It is surprising how many different subjects can be correlated with so simple a thing as a nail, for instance. What is it made of? How and where was the metal mined? How was it brought here? How was it



made? What is the nail for? Why would not some other kind of nail or something else do as well for the purpose? What was used in place of nails before nails were invented? These and many other questions can make a nail the basis for bringing in practically all of the other studies of the school, if the teacher has the pedagogical knowledge and skill to keep the class interested. Just how are teachers doing this sort of thing? What are the details of the methods they use to correlate and to fix in the students' minds in concrete form, the abstractions learned in the ordinary scholastic subjects, for which the students can see no use. How does the teacher stimulate his students to see that the scholastic studies actually have a bearing upon anything as practical as handwork and thus give them an entirely new viewpoint? If there were certain standard methods of teaching, standard because they have been found efficient by most teachers, they should be presented to other teachers in usable form; so much for suggestions regarding what ought to be done.

The variety of opinions of what a course in educational handwork should consist, constitute a menace to the efficiency of the subject of handwork as a whole, and would surely be an obstacle in formulating a standard of attainment. The artistically inclined teacher of the lower grades can bring an array of unanswerable arguments which prove to her satisfaction, at least, the supreme educational value of making book covers and decorating them with splotches of color which resemble clover leaves or something equally decorative. Others will claim that the most logical manual training is weaving, basket-making, clay pottery which is never finished, cutting, pasting and folding paper, etc. Most of these are potentially good, and for the lower grades may be made interesting and profitable as they help to an understanding of form, measurements, proportion and color, and the elementary processes of civilization, if they are properly taught, but if they are used simply as work to keep little hands and minds busy while the teacher does something else, their educational value is slight.

Those who adhere to the antiquated doctrine of formal discipline may be persuaded that the student who is busy is accomplishing all that is desired, but among the fifty or more different materials used in various schools, certain of them must be of more value than others of equal educational efficiency either from the viewpoint of availability of supplies or equipment, or because they may be taught by the regular teacher instead of requiring an expensive specialist.

The manual arts as an educational factor has not changed in any important respect for years. New projects are appearing continually in different publications, all of which are good as projects, but they include nothing but processes and problems of construction which have been worked out in different forms times without number. The simple publishing

of new projects, however good in itself, does not touch the weak spot in the teaching of manual training. There can be no question regarding the need of projects nor of their value as suggestive material, but there is a decided question as to methods applied in teaching, or in pointing the way for the student to help himself, which is the best kind of teaching. The fact that the different teachers have many different methods of presenting a lesson to a class, suggests that some of these methods are decidedly superior to others and if there could be a standard of pedagogical aim and requirement an exchange of experiences would be mutually profitable.

The present confusion of pedagogical practice involves something more fundamental than the models the students make; the interest and the methods of fostering and utilizing that interest are the essential considerations in the pedagogy of the manual arts, rather than the difficulty of the constructive processes, or the excellence of the finished project which may be due to the natural ability of the student, rather than to anything he may have learned. No one viewing the handiwork of a student can tell how much he has profited by the correlation of the manual arts with other subjects, or whether the project is due to the initiative of the student or to pressure of the teacher.

Such aids to the average teacher would do much to prevent the infliction of methods suitable for use in the high school upon students of the intermediate grades or vice versa, and of confusing educational handwork and vocational training, and the type of teaching which considers that the development of hand skill is the aim and end of educational handwork.

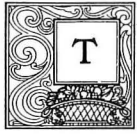
The pedagogy of reading, language, arithmetic, etc., has been treated in minute detail and there are vastly greater possibilities in the application of pedagogical methods in the teaching of manual arts.

Many teachers of the manual arts today are chiefly concerned in their subject matter and in improving their own hand skill; this is commendable so far as it goes, as it helps in teaching by adding to their facility in demonstration, but often details of presenting the subjects to classes of different ages are not carefully thought out for the reason that the same methods cannot be successfully applied to students of different ages. By experience a conscientious teacher develops methods which are practiced and refined and eventually become pedagogically correct or else they are discarded. Experiences of this sort should be exchanged, the same as new methods discovered by teachers of other subjects are eagerly sought by enthusiastic and progressive teachers.

There is an opportunity and demand for articles dealing with method, related to but separate from the subject matter, for while the manual arts are rich in projects and motives for work, every teacher can in most cases improve his work by knowing the details of the methods used by his successful brethren.

# WHAT OF ART EDUCATION?

Royal Bailey Farnum, Specialist in Art Education, New York Education Department, Albany, N. Y.



THE world is at war. Industrialism, militarism, socialism, and all the other great problems of the day, acutely alive and vitally active, tend to promote excessive action in thought and word and deed. This seems to be unhappily true in the teaching world, as in all else. Our well regulated courses of study, our graded systems of class instruction and our definitely outlined problems are going by the board. New ideas resulting from the world's upheaval are being violently discussed and rapidly introduced until in a state's school system there are nearly as many different schemes of instruction as there are schools.

Now, all this is good. The world cannot change without changing the details of civilized living. The lessons to be derived from a world at war, from industrial fervor and from ascending socialistic heat should find early application, of course. We would be criminally negligent if we did not recognize all this. But there is little reason for losing our heads over the situation. For that, it would appear, is what we are doing.

The delirious craze for dancing, in itself a fine art, but which is at present ruining the lives of thousands of youths who should be strengthening both mind and body for uncertain futures; the excessive desire for movie thrills which is debauching the minds of millions; the wild striving for money regardless of the rights of the other fellow and in spite of the nation's plea for loyalty; the unholy desire for excitement of any kind whatsoever—these are indications of unstable mentalities, of the intellectual unsoundness which is making headway in the field of education.

This seems to be especially true in the art world. Perhaps I realize its presence here more than elsewhere because this is the field in which I labor. I am not sure. But of this I am certain—that there are many indications of unsoundness, dementia and hysteria in this direction at the present time.

What a race of sheep we are. One would think that our brains which, alas, seem to be too often unrealized, are meant only for parrot-like use. The blind following the blind seems veritably true.

I believe the first disturbance in my otherwise placid mental existence came when, after having attended the Fourth International Art Congress in Dresden during the summer of 1912, I found many good Americans sounding the cry that we, in this country, lacked color; we were dead; our art showed no life. Now I had, on that never-to-be-forgotten trip, passed by easy stages up thru Italy and Germany. I had seen the works of the great men of the Renaissance, and the later masters. I had visited the

Pitti and the Uffizzi galleries; Rome with its Forum, its churches and its modern art; Venice and the world colorists and old Nuremberg of craftwork fame. I saw the wonders of the old and new Pinacotheks and the vast treasures of the Dresden gallery. And finally in the great exhibit halls of the Congress I beheld the modern art which the aforesaid United States citizens hailed as live art in comparison to our "dead" contributions.

But to this day I have never been able to wholly accept these statements so favorable to our enemies abroad, so detrimental to ourselves. My visits to the shrines of the masters lead me to think otherwise. And today I even incline to the thought that what to unaccustomed eyes were evidences of life were really quite the opposite; they were the highly colored eruptions of the unwell; they were but symptoms of the unholy struggle so soon to be revolutionizing the world. The flashing color, the raw design were startlingly interesting to be sure, but they were the heightened color of the burning fever within. For how could a nation, drunk with militarism and industrial power, avoid the outbreaking of an overburdened system?

I acknowledge that my first disturbance was slight. I hadn't fully sensed the situation and so was passively surprised. But soon I noted many outcroppings of this overseas dilemma within our own boundaries. Department stores were startling the innocent public with "new art;" new craft shops and "modern art" departments in the old reliable firms were being organized. Supervisors here and there were not only seeking brilliant color, they were actually introducing without reserve the identical problems in all their strange and bizarre uncouthness found abroad.

So far as I could tell, the only reason for this was the American's characteristic desire for a quick change, and because such impatient wishes call for immediate results, imitation is resorted to. Now I am beginning to believe that it is due to intellectual thoughtlessness.

At any rate, up and down the Fifth Avenues of our cities and in the courses of many of our schools appeared and still appear gaudy, over-colored, badly decorated, ugly proportioned and altogether hysterical objects of our newest art craze. I say "still appear," for one sheep has literally followed another. The following still continues. To make my words more clear I will enumerate some of these crudities which so many teachers have heedlessly nourished.

Item No. 1. Cylindric pasteboard and wooden boxes, the one purchased from the oyster man, the other from the cheese factory, triumphantly borne to the classroom and made the basis of five weeks'

labored effort in the name of art and in the hope that a "collar button box" or a "jewel casket" will result. But alas! they remain oyster cartons—cheese boxes. And yet—a three-cent oyster box plus unprincipled decoration and stage color sell for many dollars each on the "avenue." Surely the war is not wholly to blame for the high cost of living. As a receptacle for candy the material and possibly the design may be acceptable, for such a purpose is not lasting, but this is the very question we fail to ask of ourselves—"Is this *right* for my purpose?"

Item No. 2. Flattened, frozen, stiffly sewn bird shapes, as brilliantly colored as we can make them with our dyes, sewn on hats so that the lifeless and formless bird's back breaks at least once in its desire to become recognized. Why a bird if color is all that is desired, and why the crude color if it is never related to the hat or wearer?

Item No. 3. Brilliant plush pillows with china, concrete, bronze or painted wood cats, dogs and monkeys restfully (?) curled upon them. They are said to "add a touch of color." They do; but it is more than a touch; they enjoy the whole stage.

Item No. 4. Ugly-shaped bottles, screw-threaded preserve jars, clear glass tumblers and tile pipes, painted like Joseph's coat of many colors, varnished or jap-a-laced and compelled to shout loudly while they hold a graceful flower within their unlovely shapes. I firmly believe that flowers should speak for themselves and consequently that vases should maintain graceful form and be simple, quiet and refined in color, or uncolored if the receptacle is of transparent glass.

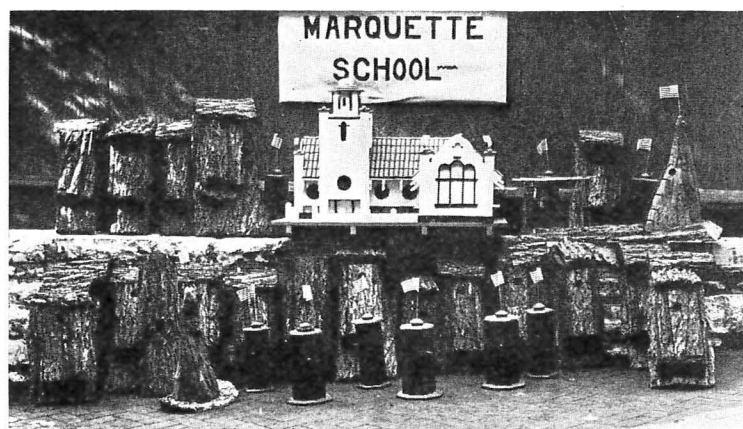
Item No. 5, No. 6, No. 7, etc. Cretonne lined and covered tool boxes! Owl shaped and realistically painted telephone cabinets! China fruit in the basket! Ornaments in flaring color! "Ideal" room interiors

and imaginary house planning when we all have real homes offering real problems! Period furniture in modern flats! Overlapping floral rosettes, unrecognizable as flowers, but painfully brilliant, painted on chairs, bureaus, cabinets, beds, walls, doors, kimono, slippers, hats and evening gowns without fear or favor! And many other unbeautiful, highly colored, ill-adapted, crudely designed and brazenly executed commercial "art" things which will shortly go the way of pyrography, stamp decorated plates, cigar ribbon cushions, monogram photograph frames and diamond filled teeth.

Now I know that I tread upon tender sod. And I appreciate that latest gift that has been made to the commercial art world, the colored poster and the commercial stamp, but why must we encourage the other things? Must we be forever serving the unsavory, tho tempting, viands of thoughtless promoters of "New Art?" Are we too heedless of the elements of beauty, the principles of color and design, the laws of harmony, not to seek their aid in our art? Can we not adapt what we find to express our own ideas, our own lives, our own emotions? For I cannot believe that the sights and wonders of many art rooms, gift shops and craft stores are the honest expression of the American people.

Should we not most seriously question whatever we see and ask ourselves what educational value it may have, what principles it may teach without violation, and what real contribution to the future greatness of American art does it offer?

Let us then counsel wisely together. Let us study our own needs, define our own aims and express our own selves, that what we do may be built upon stone and not the shifting sands of a delirious age, for the future holds great things in store for art education.



Group of Bird Houses made in the Marquette School, St. Louis, Mo. Mr. Charles P. Coates, Instructor. The large house was made as a group project in which ten boys participated.



# SOME AIDS FOR MECHANICAL DRAWING

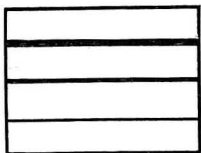
Earl D. Hay, Instructor in Drawing, Wisconsin Normal School, Oshkosh, Wis.



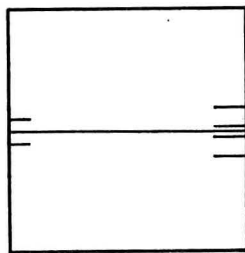
EVERY teacher of mechanical drawing at times desires some means of presenting some very precise things in a clear and definite manner to his students in order not only to teach them to be exact and accurate, so essential in mechanical drawing, but also that the work of the class may have a pleasing uniformity as well. Every drawing teacher knows, too, that the high school student or college freshman does not think to use the same degree of accuracy in laying off small dimensions as he does in laying off large ones; that is, he would think that it was just as accurate to lay off a line a quarter of an inch long within one-sixteenth inch as laying off a line four inches long within the same limits.

In no part of the work is this lack of care and accuracy more noticeable than in the width of ink lines and in the size of letters, numerals, arrow-heads, and fractions. It is not sufficient to tell the students to make the border line a heavy line, the object line a medium line and the dimension line, center line, etc., a light line; neither is it enough, tho very definite, to say that these lines shall be drawn  $1/32''$ ,  $1/64''$ ,  $1/128''$  in width because the students have not learned to use their scales with the proper degree of accuracy by this time. Some will give good measure; some less; and almost all will fail to preserve the proper ratio between the widths of the lines.

To meet this condition the author makes use of the device shown in Fig. 1. This is a piece of tracing cloth  $\frac{3}{4}'' \times 1''$  in size with three lines ruled entirely across its face. These pieces are easily and quickly



*Fig. 1.*



*Fig. 2.*

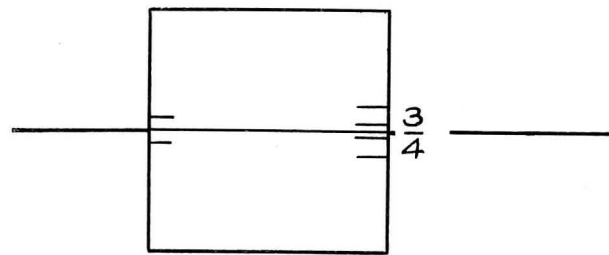
made by ruling successive sets of the lines of the desired widths across a sheet of tracing cloth; cut the sheet in strips containing the sets of lines and then cut the strips in rectangles of the desired length.

To use the line width guide, a trial line is ruled with the pen outside the trimming line of the tracing, and the guide placed at the end of it so that one can sight along the trial line and the line on the guide and tell if they are of the same width. The pen is adjusted until the two lines appear to be one continuous line.

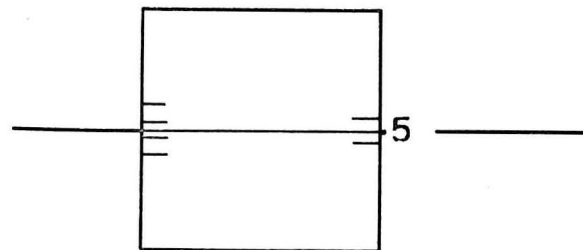
The line guide is especially valuable in tracing

drawings which contain lines tangent to circles, for without it one must set the ruling pen entirely by guess to match the arc previously drawn with the compass pen, but with the guide one is sure that the lines will exactly match.

To secure uniformity in heights of dimensions and notes the author uses the device shown in Fig. 2. It is made of a piece of thin white cardboard just large enough to hold easily with the thumb and forefinger and has the heights of letters and numbers indicated with fine lines drawn to the edge. To use it in laying off dimensions, the card is placed over the dimension line so that the long line on the card is in line with it. This brings the spacing lines next to the opening in the dimension line so that the heights and spaces of the fractions and numbers are clearly seen



*Fig. 3.*



*Fig. 4.*

as in Fig. 3 and Fig. 4. A better way to use the guide, however, is to put in a few dimensions by eye and then check with the guide, for in this way the student quickly learns to judge the correct size of the numerals and to outgrow the use of the device.

## The Rule; a Help or a Hindrance.

Two years ago a shop teacher, in speaking of his class in woodwork, made the remark that they had not been trained to use their eyes. If he sent them to the storeroom for a piece of  $\frac{3}{4}''$  stock they were just as likely to bring back a piece of  $\frac{1}{2}''$  or  $1''$  stock unless they took a rule with them. They could use a rule very well but were entirely dependent upon it and were helpless without it.

This teacher's complaint gave me a new idea for my drawing course. Up to this time I had thought it sufficient for me to teach my students how to use the scale correctly. Now I could see how it might also be possible to teach them how to do without the rule correctly at times and still be better and more efficient workmen.

This thought led me to introduce in our course in freehand sketching a series of problems in estimating, making it unnecessary to change the sketching course to any extent. It was principally a matter of changing the method of attack. We started in by laying off the border spaces by eye and checking with the ruler instead of laying off the spaces directly from the scale. In laying off a dimension directly from the scale the student does not have to think about the length but about operating the ruler correctly, while in laying off a certain length by eye he must think of the size of the space and nothing else. He must use his judgment and make comparisons repeatedly. His next step is to check each judgment by laying the scale on the space estimated and if it is not accurate enough erase the mark and make a new estimate. Our limit of accuracy in sketching was finally made  $\frac{1}{16}$  of the length of the line or space estimated. All errors greater than this are corrected by making a new estimate.

The students were also given problems in comparing lines in various positions and combinations in order that they might learn of some of the more common optical illusions which tend to deceive the uninitiated, such as drawing squares, circles, and

ellipses to a definite size and in drawing vertical and horizontal lines thru the exact center and the optical center of squares and rectangles. Each student was also urged to discover his own personal tendencies and to act accordingly in making his estimates. For example: It was found that in estimating the center of a line some would invariably estimate too far in one direction and others too far in the opposite direction.

After about a month a quiz was given on the estimation of distances. It ran as follows:

1. Lay off, by eye measure only, lines of the following lengths,  $\frac{1}{4}$ ",  $\frac{5}{8}$ ", 1",  $1\frac{3}{4}$ ",  $2\frac{3}{8}$ ", 3",  $4\frac{1}{2}$ ".
2. Draw a square of two inches on a side.
3. Draw a circle of one and a quarter inches in diameter.
4. Draw an ellipse whose axes are  $1\frac{1}{4}$ " and 3" in length and make an angle of  $45^\circ$  to the horizontal.

It was a genuine surprise to find the average of the class on this quiz between 85 and 90.

This matter of estimating lengths and spaces is also carried over into the mechanical drawing work in that the students are required to gage the size of arrow-heads, dimensions, dashes and spaces of invisible lines, hatching lines, and spacing of dimension lines by eye and correct their estimates with the scale until they are sure of making them within the required degree of accuracy.

We have tried this plan out for two years and find it a very valuable addition to our work in drawing and sketching and one very much worth while.



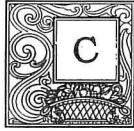
BIRD HOUSES MADE BY SIXTH, SEVENTH AND EIGHTH GRADE BOYS, WALLA WALLA, WASH.  
Mr. A. R. Lorenger, Supervisor of Manual Training.



The bird houses illustrated above were made by the seventh-grade pupils in the Nashua, N. H., schools under the direction of Mr. Ernest W. Beck and Mr. John Palmer. The houses were made as a regular project and each boy was required to design, as well as make, a house. No two of the houses in the illustration, and there are more than one hundred, were alike. Five prizes of one dollar were awarded.

# BIRDS AND BIRD HOUSES

Chas. B. Diers, Instructor of Manual Training, Duluth, Minn.



**C**HARLES K. REED says: "The native birds are one of our nation's most valuable assets. Destroy them and in a comparatively few years the insect life will have multiplied to such an extent that the trees will be denuded of their foliage, plants will cease to thrive and crops cannot be raised." We should try to increase their number in our cities by looking out for their welfare.

To increase the number of birds about our homes we must protect and house them. Many birds prefer living near homes and soon learn where they are welcome. Birds are subject to a great number of dangers. Thousands are killed, yearly, by flying into telephone wires, towers, windows, etc. They also often die of starvation, fatigue, cold, and falls from improperly supported nests. The gentle kitty, of your household, is one of the bird world's worst enemies. It has been estimated that an average of fifty birds a year is the toll of every cat.

The school boy or girl can help lessen these dangers by preventing boys and cats from killing birds, by feeding them when food is scarce, and by building houses for nesting places.

## The Building of the Bird House.

The building of houses and shelters, the placing of drinking utensils, and the feeding of the birds have been recognized as the practical solution of retaining our feathered friends about our homes.

There are two kinds of bird houses that we are especially interested in: those made of metal, such as old tinware, cans, coffee pots, and the like; and houses made from wood, as boards cut and planed to correct size, or houses made from slabs, pieces of log, and branches of trees.

In using tinware for houses the first thing to consider is the doorway. It makes little difference what shape the door is, so long as the bird can get in and out safely. This is proved by the odd shaped holes a bird will use in natural surroundings. However, great care should be used to see that no sharp edges are left on which the bird might cut its feet or body. Tinware houses should always have a drainage hole in the bottom side and should be located in a shady place. This type of house becomes very warm, in summer, if not properly placed. The mother bird has been known to come to the door of an improperly shaded tin house, virtually gasping for breath.

Great care should be taken, in placing the door of a house, so that it leaves enough space below for the nest, but is not too hard for the bird to reach when leaving the house.

There also is an advantage in making the door just large enough for the bird for which the house is built, but too small for the sparrow. Wrens and

chickadees have been known to fuss around the small entrance of a house for hours, trying to get their nesting material inside. By making the doorway just a little larger, and by leaving off the perch, this trouble may be avoided. Sparrows do not like a house without a perch.

The United States Department of Agriculture, in its Farmer's Bulletin (No. 609), gets out the following list of dimensions for bird houses:

Species	Floor of cavity, inches	Depth of cavity, inches	Entrance above floor, inches	Diam. of entrance, inches	Height above ground, feet
Bluebird.....	5 by 5	8	6	1 1/2	5 to 10
Robin.....	6 by 8	8	*	*	6 to 15
Chicadee.....	4 by 4	8 to 10	8	1 1/2	6 to 15
White-breasted Nuthatch.....	4 by 4	8 to 10	8	1 1/2	12 to 20
House Wren.....	4 by 4	6 to 8	1 to 6	1 1/2	6 to 10
Tree Swallow.....	5 by 5	6	1 to 6	1 1/2	10 to 15
Barn Swallow.....	6 by 6	6	*	*	8 to 12
Martin.....	6 by 6	6	1	2 1/2	15 to 20
Song Sparrow.....	6 by 6	6	†	†	1 to 3
Phoebe.....	6 by 6	6	*	*	8 to 12
Crested Flycatcher.....	6 by 6	8 to 10	8	2	8 to 20
Flicker.....	7 by 7	16 to 18	16	2 1/2	6 to 20
Red-headed Woodpecker.....	6 by 6	12 to 15	12	2	12 to 20
Golden-fronted Woodpecker.....	6 by 6	12 to 15	12	2	12 to 20
Hairy Woodpecker.....	6 by 6	12 to 15	12	1 1/2	12 to 20
Downy Woodpecker.....	4 by 4	8 to 10	8	1 1/2	6 to 20
Screech Owl.....	8 by 8	12 to 15	12	3	10 to 30
Sparrow Hawk.....	8 by 8	12 to 15	12	3	10 to 30
Barn Owl.....	10 by 10	15 to 18	4	6	12 to 18

\* Open on one or more sides.

† All sides open.

Altho no arbitrary shape and size of a bird house are always essential, so long as it is large enough, it is well to keep in mind the dimensions given, as they are the result of much investigation and experience. Then, too, by following them we are more likely to build our houses suitable to the bird we wish to have occupy them.

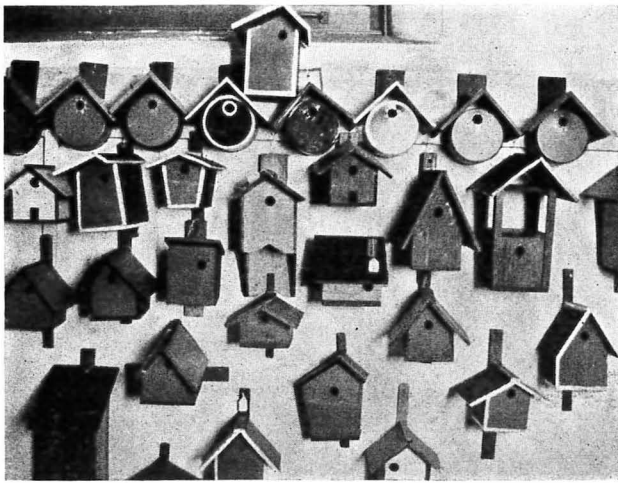
The making of a bird house, out of boards, is so simple that any boy, with a saw, plane and hammer, can build one. Decide upon the kind of a bird you wish to build for, the shape of the house, and then go to work. It makes little difference whether the surface of the lumber is planed or not, as long as all pieces are made the right size, and all the joints are tight and well nailed, so as to give them no opportunity to warp or crack open. A piece of tin along the apex of the roof will guard against the rain soaking in at that joint. A perch is no longer considered necessary, as it only affords the sparrow an opportunity to sit and bother his more useful friends, the song bird

## When to Put Up Bird Houses.

Most bird authorities say that the best time to put up bird houses is in the fall of the year. This gives the weather a chance to wear off the appearance of newness, which birds do not like.

One manufacturer of bird houses makes the following statement: "I have found, by long experience, that the birds are much more likely to take possession of a house that is not brand new. Get your bird houses placed so that the appearance of 'newness' will, at least partially, have disappeared before the birds come along in spring. Birds are very particular little beings and you may be surprised to know that I have to be very careful not to paint the





Part of a Bird House Exhibit, Duluth, Minn., Schools.

inside of the compartments, or even the edges of the doorways leading to the compartments, until the houses have been once occupied. After that it doesn't seem to make any difference."

When it is not possible to put up the houses in the fall, the next best time is in the early spring, before the birds arrive. However, houses may be put up at any time of the year. Get them up whenever you finish them—don't wait for any particular date, for in waiting you lose your enthusiasm and forget.

#### Where to Place Bird Houses.

Authorities on birds differ as to the location of bird houses. Some insist that houses should be located in shady places, others in sunny positions.

Wooden houses, placed on bare poles near shady trees, have been very satisfactory. Tin houses, which get scorching hot in summer, should always be located in shady places. Both should have plenty of air.

If the house is placed on the trunk or branch of a tree, which is leaning, it should be hung vertically, or with the upper part projecting a little, in the direction of the opening, which should be away from the direction of the prevailing winds. It should always be placed on the under side of the branch, as the rain is apt to beat in and drown the young birds.

Houses which are hung by wire, in a tree, are well liked by the birds and are much better protected from cats. In hanging a house by wire, be careful that the wire is not too long, as a strong wind would throw the eggs out of the nest. Sparrows do not like houses which swing in the breeze.

#### Providing Nesting Material.

The builders of bird houses often make the mistake of putting the old nests, found in bushes and trees, into their houses, thinking that it will encourage and help the bird in nesting. Birds, using houses, do not like the old nests of other birds.

Nevertheless, aid can be given birds in securing material for their nests. Birds are always attracted to

places where good nesting material can be found. A little mud pile, located where the robins, swallows and phoebes can find it, will be very much appreciated by them. Cotton, wool, bits of rag, twine, hair, hemp, lint, bits of wood, dried grass, etc., will readily be used by the nest builders. These materials should be scattered about the ground or hung in a tree, where the birds will be sure to find them. Never use waste. All fibrous substances must be free from tangles and cut into lengths of about five inches. This is necessary because, more often than one suspects, birds lose their lives by getting their feet tangled in these materials, while carrying them to the nest, and get hung in the branches of the tree.

#### Foods for the Birds.

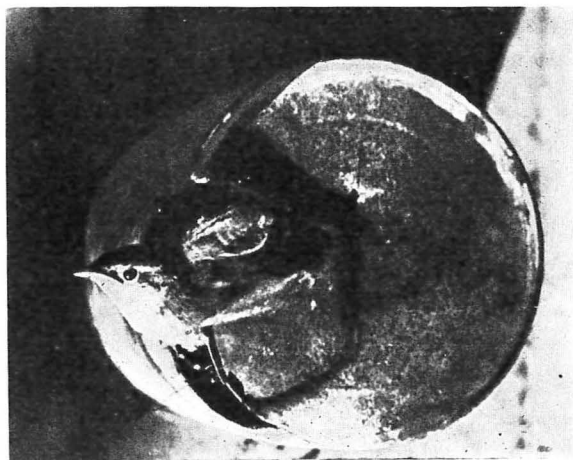
A good way to keep the birds with us, the year around, is to provide food for them.

Some birds will eat off the window sill, or from shelter erected for that purpose, while others, which are somewhat timid about approaching a house, will appreciate food tied in the trees or placed on the ground, where they can readily find it.

Seed-eating birds will usually eat from food-boxes nailed to the sunny side of a house, or a sheltered platform under a window. This latter place affords opportunity to observe the birds as they dine. They very readily eat wheat, oats, hemp, millet, cracked corn, canary seed, weed seeds, and sunflower seeds, while bread crusts and crumbs of all sorts will quickly disappear.

The fly-catching and worm-eating birds like fat pork, ground meat, marrow bone, various vegetables, especially bits of celery or lettuce, apples, raisins, and berries. Both seed-eating and fly-catching birds seem to like suet, and when the snow is on the ground, a little sand or poultry grit, placed where they can find it, will be appreciated greatly by them.

Birds often suffer from lack of water, and whenever opportunity permits, they should be supplied with it.



Wren Nesting in an Old Can.  
(Photographed by the author)



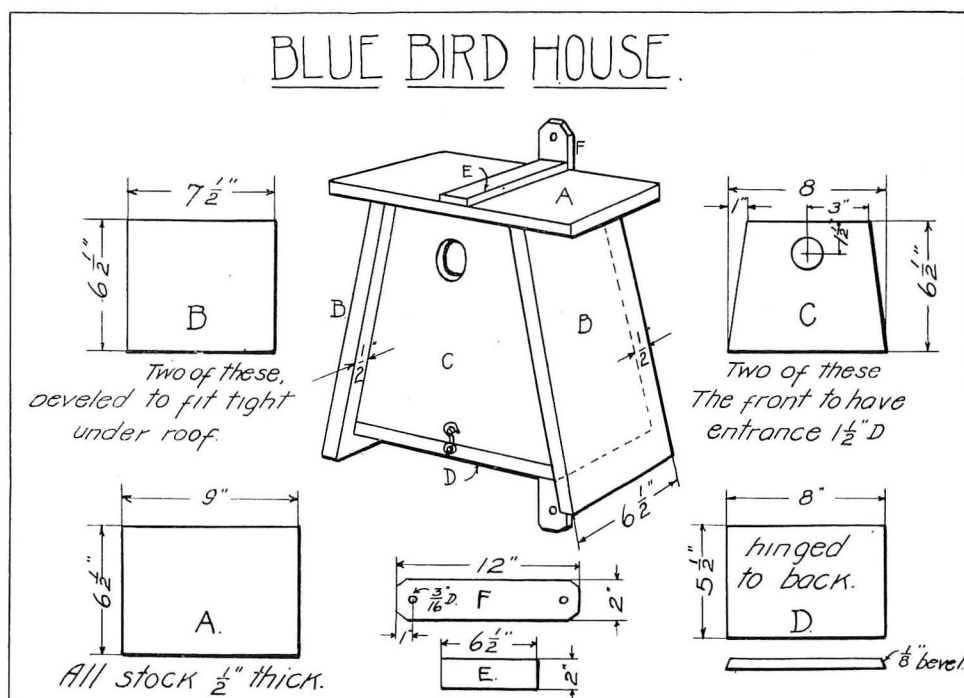
# BIRD HOUSE PLANS

L. H. Baxter, St. Johnsbury, Vt.

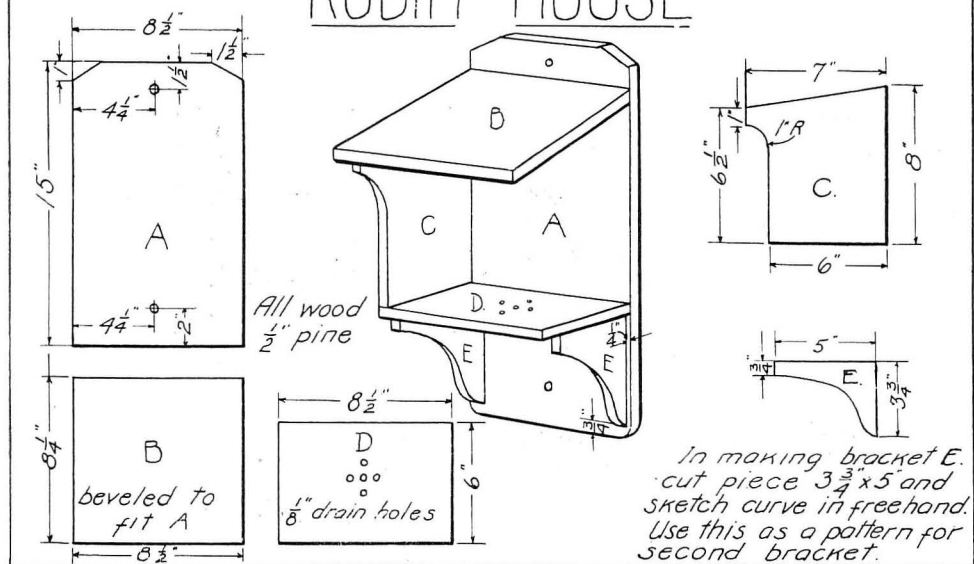


SEVENTH-GRADE BOYS WITH THEIR BIRD HOUSES, ST. JOHNSBURY, VT.  
Mr. L. H. Baxter, Supervisor of Manual Training, Grammar Schools.

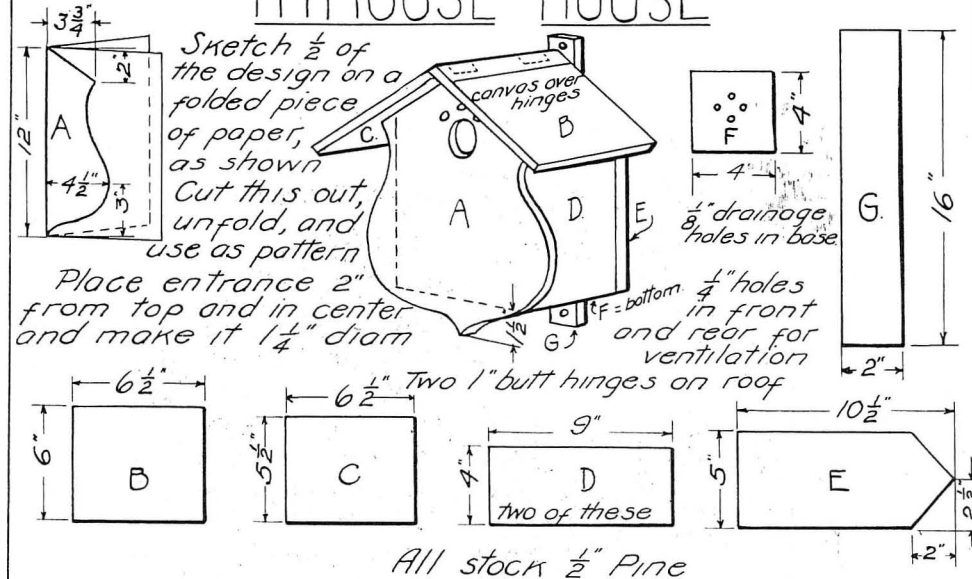
The designs for bird houses shown on the subsequent pages have been used with success in the grade schools of St. Johnsbury, Vermont. They formed the working basis from which the boys represented in the illustration worked out their own designs for a successful contest in the spring of 1917.



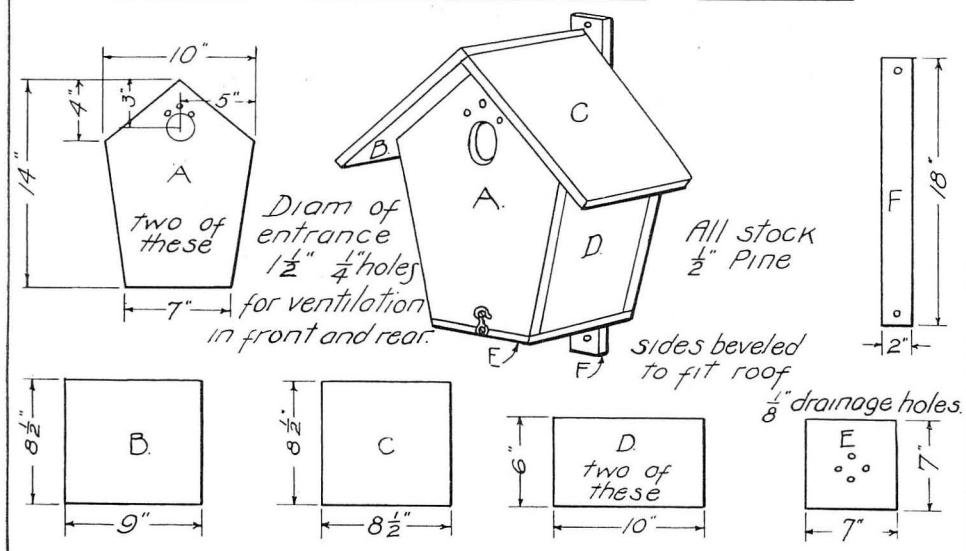
## ROBIN HOUSE



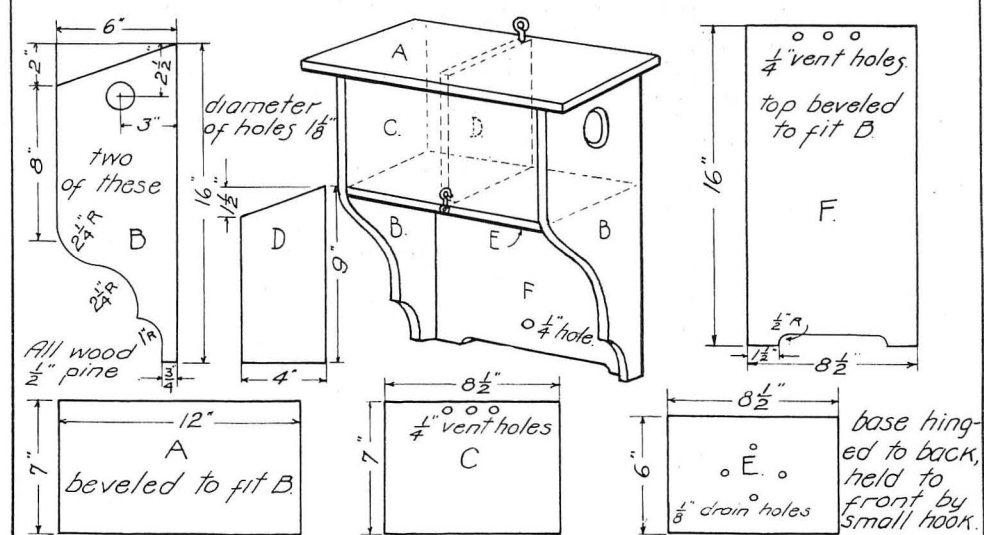
## TITMOUSE HOUSE



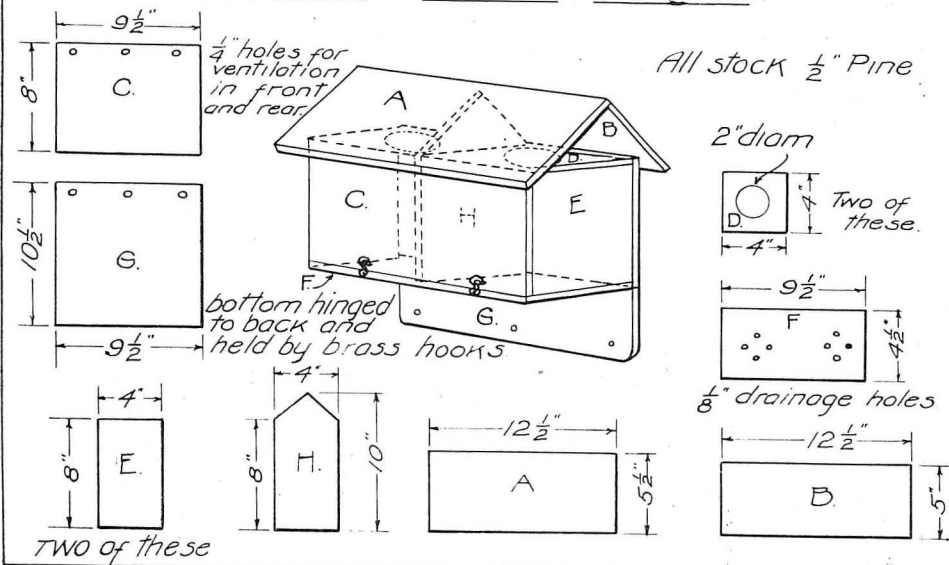
## HAIRY WOODPECKER HOUSE



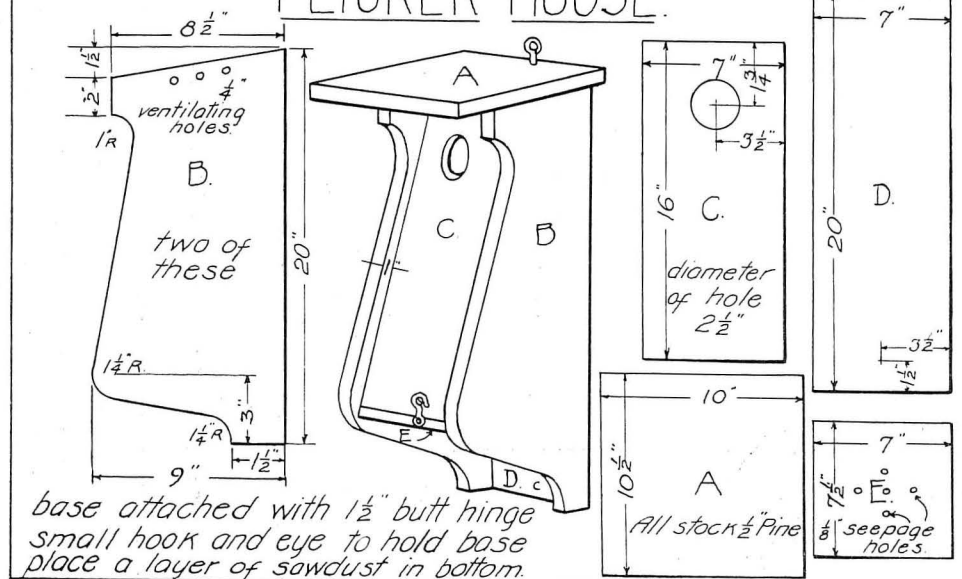
## DOUBLE CHICKADEE HOUSE



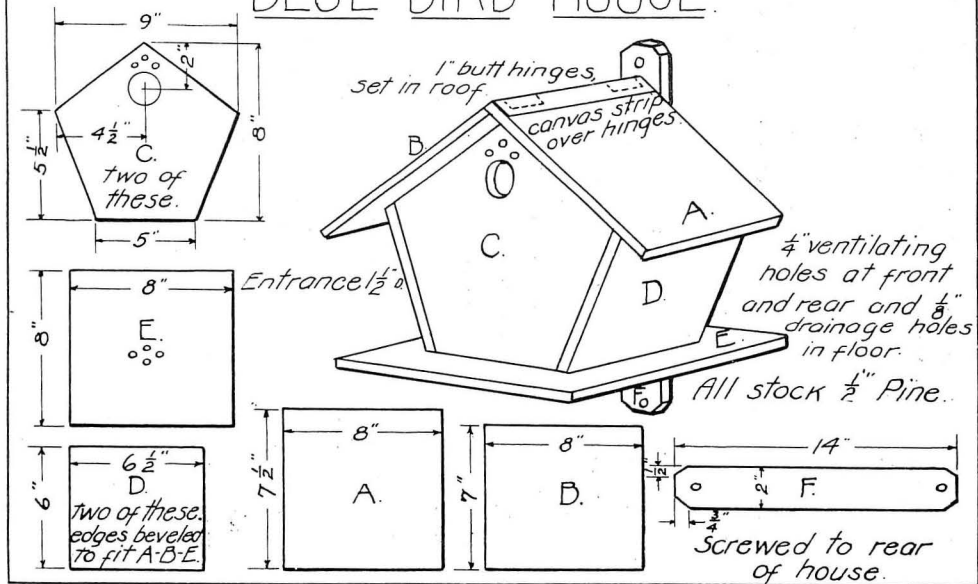
# DOUBLE WREN HOUSE



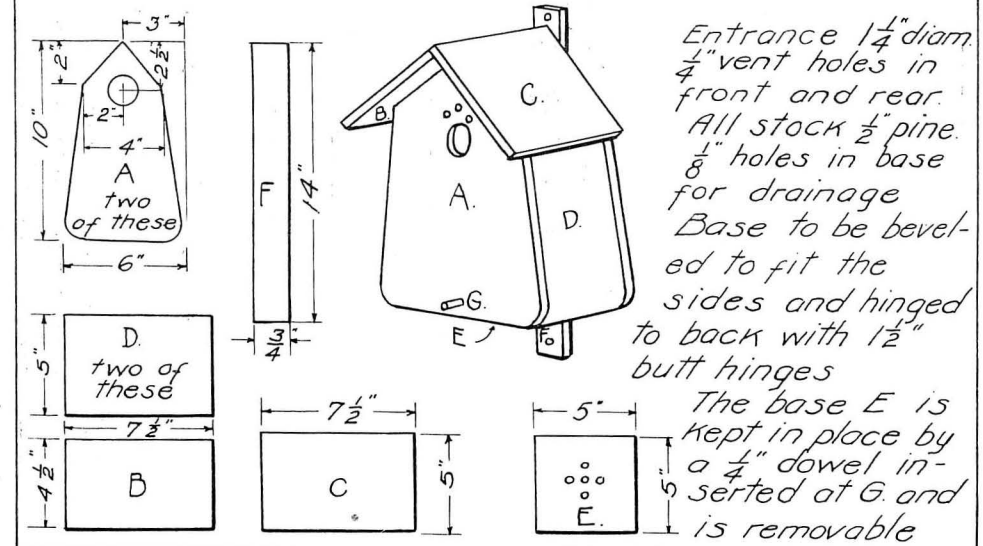
# FLICKER HOUSE



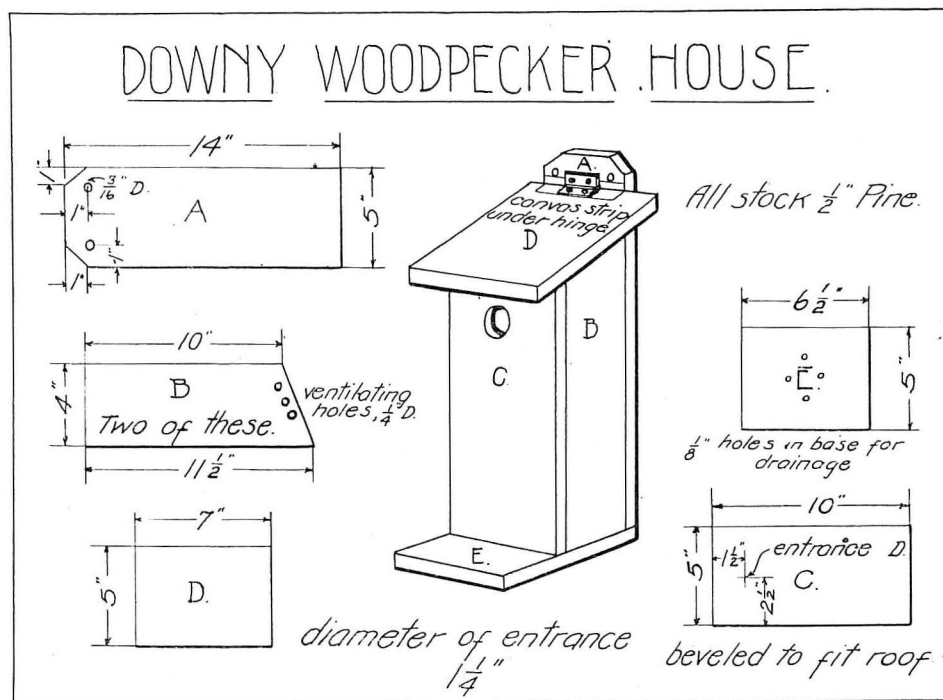
BLUE BIRD HOUSE.



# NUTHATCH HOUSE







DESIGNED BY L. H. BAXTER, ST. JOHNSBURY, VT.

## A Minnesota Range-Town Bird House Contest

O. E. Saxhaug, Manual Arts Instructor, Crosby-Ironton, Minn.



THE bird house contest in the Cuyuna Range towns, Crosby and Ironton, Minn., was open to girls and boys from the fifth grade thru the high school, whether they had taken the woodworking course or not. Then the problem of having pupils with no experience whatever in woodwork, make houses, had to be met.

Previous to the time that actual construction began on the houses, bird study had been taken up in a very interesting manner in the classroom. Colored bird pictures were exhibited, drawings in crayon and water color representations were made, in addition to writing essays and having bird stories read. By these means a great deal of interest was stimulated and the pupils were anxiously awaiting the time when they could commence building their little house.

Pupils of the same grade who had not taken the regular course in woodwork were divided into several groups, as were the classes that had taken the course up to that time. For the classes with no experience in the shop, in handling tools or in designing houses, large drawings were made on sheets of drawing paper and hung up before the class from which selections could be made, and a majority vote for some particular design determined which house this group would make. The group of drawings from which selections were made were to be constructed out of sawed lumber and the pupil had a choice of making a second house from original ideas and making it rustic, or converting the first house into a rustic house. Several varieties of designs were used.

For the classes which had had experience, a list of proportionate dimensions of houses for various kinds of birds was placed on the blackboard. Types of houses for various birds were discussed and the pupil told to make a drawing of the house he wished to construct, with individual assistance when necessary. When practically all the drawings were completed, explanations and demonstrations were made, showing how the sides of the houses were constructed. Especially was this necessary when a class was making martin houses for colonies. The pupil, however, was encouraged to use initiative in constructing his house and we endeavored in this way to stimulate originality.

We fitted one room for painting, having each color of paint on a separate bench or box and several brushes with hooks screwed in the handle, so they might be hung in the particular paint when not in use. The pupils were allowed to paint their house in any scheme they wished. Some wished to use several different colors, applying only one color at each painting, and many trimmed the corners and eaves with a different colored paint.

As soon as the house was dry the pupils filled out a card, on which they indicated by letter to which group they belonged and also indicating by number the kind of house constructed, in addition to placing their name on the card. With this information on the card the judges could very easily determine which group a particular house belonged in and just how they would be rated in the contest.

All the pupils had been notified of the last day on which they could enter the houses for the contest.

Following this day the judging took place. Originality, beauty, adaptability, workmanship and method of construction were the principal points under consideration, in addition to whether or not the pupil had had experience in the shop.

We also had on exhibition the various prizes offered by the business men and various companies dealing with the school, with a list and classification of the prizes. A classification was made for regular manual training students and also for all others entered in the contest. Under these two classifications were placed the prizes for various types of

were received by various students to construct houses.

One day was designated as Bird Day, a program being arranged for the afternoon. Essays on birds were given by grade students, an address on the "Study and Care of Birds" was made by the instructor in charge, birds' songs and spring songs were rendered. At the close of the exercise the Superintendent presented the prizes to the winners. The prizes were cash, tools, merchandise and books. The pupils receiving prizes were urged to send letters of appreciation to the business men donating them.



PART OF THE BIRD HOUSE EXHIBIT, CROSBY-IRONTON, MINN.

houses, which included: Martin (colony), martin (single), woodpecker, wren, bluebird, flicker, and rustic. Separate prizes were offered for sweepstake houses, and houses having the first nests. A prize was also offered for the group making the best houses in general.

An invitation to all the school children in the district was extended, to attend the exhibit. The exhibit was placed on the bleachers of the gymnasium. A rustic booth was constructed of birch logs and pine boughs, in which the houses were set about on the floor, hung down from the logs overhead, and set in forked branches of trees. Following this exhibit, the houses were divided up between the two towns and placed on exhibition in show windows, which the merchants willingly offered. All the exhibitions proved a great drawing card and very soon orders

The latter part of the afternoon was devoted to the placing of the houses. Four divisions were made of the town, in which the pupils placed themselves, according to the divisions in which they lived. Each division or group was in charge of a foreman selected from the upper classes of the shop, who had full charge of placing the houses. The pupils had been informed several days previously in regard to the placing of the houses and distance from ground. When a member of the group had his house placed, he was allowed to drop out of the group, while the others proceeded to the next nearest place.

A great deal of interest in the care and study of birds was aroused in addition to giving a great many pupils experience in practical construction. A study will be made of the construction of concrete bird baths, feeding shelves and shelters at another time.

# SEVENTH GRADE MANUAL TRAINING

J. Elmer Zearfoss, Director of Manual Activity Work, Geneseo Normal School, Geneseo, N. Y.



THE central thought in planning the manual activity work for the seventh grade this year was to get a problem around which as many as possible of the other subjects of study could be grouped naturally. Bird feeding stations and nesting boxes were chosen because of the interest the pupils had in them; because of their close relation to and carefully studied exhibitions and displays put up in the school library.

Various styles of feeding stations and nesting boxes were examined and studied. Some information was gathered from the library exhibition tables and from books and bulletins posted by the school librarian. Enlarged colored prints made by the science department were put on the display board. The ones best adapted to good work in the shop and easy to make were selected. Plans were drawn and specifications for lumber in the rough were made. The various pieces were cut to size and assembled.

The composition work was done by the practice teachers under the direction of the critic teacher of the grammar department.

The compositions, following the outline used in the shop, were written by the following pupils and chosen because they gave some idea of the knowledge the children gained about feeding the birds; how to attract birds; and what kinds of nests to put out.

Topics discussed in the shop:

1. Birds in general.
  - (a) Nature of birds.
  - (b) Food for birds.
  - (c) Methods of feeding.
  - (d) Bird protection.

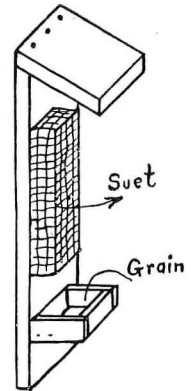
- (e) What kinds of nests to make for the different kinds of birds.

- (f) Differences of openings; cavities; floor space; construction and why.

Drawing plans and making bills for materials.

- (g) Building: cutting the parts to dimensions, assembling, locating opening properly, boring hole correct size.

- (h) Location: study the best ways of hanging nesting boxes and feeding stations.



Feeding Station made at the Geneseo Normal School, Geneseo N. Y.

## A Discussion of Chickadees.

The Chickadee is a small bird about five inches long and the only difference between the male and the female is that the male is a little larger than the female. Its wings are a soft gray, its breast is a yellowish gray, tail black-and-white, and on the top of its head is a black cap. It has a black throat, the rest of the head being white.

It eats insect pests, grubs and fat meat. In a book I read, it said that the Chickadee was wholly beneficial because it eats insect pests. It also said that it eats four brown-tailed larvae in one minute. Twenty-four of these birds are sometimes killed by a cat in one season.

Some people feed the winter bird by putting up feeding stations. The construction of one type of these welcome "free lunch counters" may be seen in the above diagram.

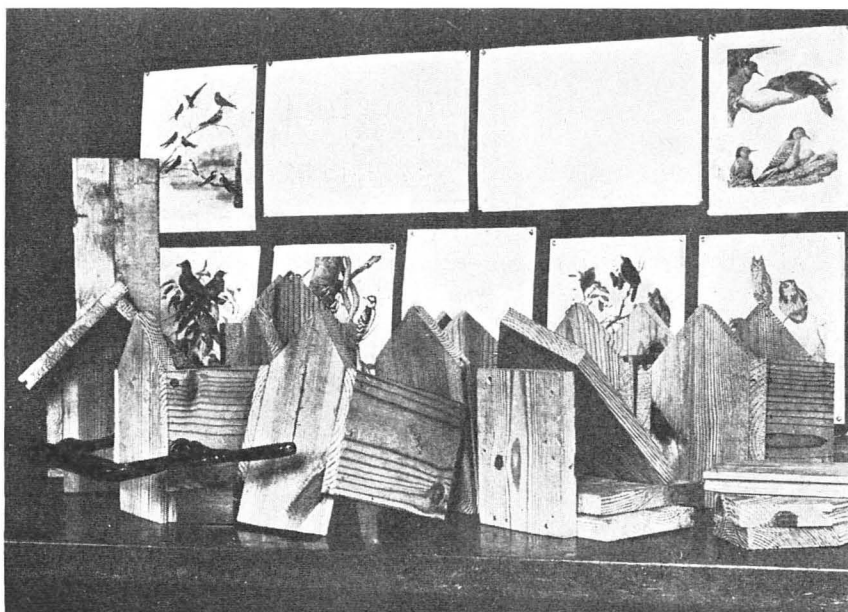
A window feeding shelf will attract birds. In placing a feeding station it is advisable to have it near a bush so smaller birds when feeding, if attacked by a larger bird, may take refuge in the bush. There are laws protecting birds, and societies for the protection of birds and animals.

If one desires to put out nesting boxes, there are several things one must remember. First, the size and shape of the nesting boxes, which depends greatly on the bird for which it is being built. For the Chickadee these are the dimensions: The diameter of the entrance is  $1\frac{1}{2}$  in., the floor cavity 4 by 4 in., depth of cavity 8 to 10 in., and the entrance above the floor 6 to 8 in. The second point is, where and at what time to hang it. The Chickadee's nesting box should be about 6 to 15 ft. above ground.

A good time to hang out any nesting box is very early in the spring so it will not look new; besides early in the spring the birds are looking for a good nesting place. If you want a good book about birds, "Bird Friends" by Gilbert H. Trafter is a very good one. Chapter XIX tells about nesting boxes.

Some of the boys in our grade made nesting boxes in the manual training room and a good many of them had birds in them, so I am sure that if you make one and hang it out you will have as good luck as did our boys.

*Audrey Cooper, Seventh Grade.*



Manual Activity Exhibit of a Lesson on Building Nesting Boxes, School Library, Geneseo State Normal School, Geneseo, N. Y.



# Vocational Information as a Part of Prevocational Work

R. H. Rodgers, Stout Institute, Menomonie, Wis.



REVOCATIONAL work has for one of its purposes the equipping of the boy or girl with certain occupational experiences and information of a vocational guidance value. The experiences are gained largely

by contact with tools, equipment and materials on constructive problems typical in part of actual shop conditions. The informational aspect is the resultant of the shop contact, plus selected material concerning the various occupations not included or gained under experiences. If the aim indicated above is to be realized, this latter material must be provided. The following outline is suggestive of the type of informational material that might properly find a place in the various short unit prevocational courses.

1. Function of the occupation.  
Relation of the specific occupation to the other trades in the particular industrial organization.
2. Importance of the occupation.  
Numerical place the occupation fills, locally and nationally.  
Value of product turned out, locally and nationally.  
Comparisons with other occupations, using graphic methods to illustrate.
3. Conditions of employment.  
Mental and physical strains involved in the daily routine of the work.  
Specialization and its effect on the worker.  
Dangers involved that must be taken account of; tools, machines, appliances, rigging and scaffolding.  
Welfare work for the improvement of conditions.  
Legislation pertaining to the safeguarding of the worker.
4. Hygiene of the occupation.  
Ventilation and its relation to the health of the worker.  
Fumes, dusts, acids and poisons and their effect on the worker's welfare.
5. Economic conditions.  
Hours and wages of the occupation.  
Average number of working days and income per year.  
Average period of earning ability.  
Comparisons with other occupations, using graphic illustrations.  
Profit-sharing schemes, insurance and pension provisions.  
Legislation pertaining to hours and wages.  
Organized or unorganized as a trade.  
Evolution of labor and industry.
6. Entrance to the occupation.  
Age at which occupation is usually entered.

Various ways of entering.

Apprenticeship and conditions the learner encounters.

Legislation pertaining to apprenticeship.

7. Demands for labor.  
Relation between supply and demand.  
Factors influencing the labor market.  
Ratio between the number of workers in the specific occupations and other related trades.
8. Qualifications for success in the occupation.  
Character of education, training and experience needed for success.  
Personality, attitudes and aptitudes requisite for success.  
Importance of good health, hearing, eye sight and mental and physical alertness.
9. Opportunities for advancement.  
Lines of promotion within the trade or industry and the rewards and responsibilities accompanying them.  
Trade and technical requirements needed for advancement.  
Personality, attitudes and aptitudes contributing to promotion.

It is suggested that in presenting this material that fifteen or twenty minutes once or twice a week, if the industrial work is given daily, be devoted to a well organized talk and discussion on selected topics. Students should thoroly understand the purpose of this information and be encouraged to find material on the subjects and to join in the discussions. Teachers should, in every case, inform themselves as thoroly as possible and present the material in its true light. This type of course involves one very serious problem and that is the lack of organized references or printed material. Much of the material available must be gathered piece-meal from a great number of sources and organized to conform to some definite plan. This involves a great amount of work but the results are worth the effort.

Teachers that are working on this problem will find the following list of references very helpful.

## Pamphlets.

Vocational Education Survey of Richmond, Va., Bulletin 162, U. S. Bureau of Labor Statistics.

Report of the Indianapolis, Indiana, Survey for Vocational Education, Vol. I, II, Indiana State Board of Education.

Report of the Evansville, Indiana, Survey for Vocational Education, Indiana State Board of Education.

Report of the Richmond, Indiana, Survey for Vocational Education, Indiana State Board of Education.

Report of the Minneapolis Survey for Vocational Education, Bulletin No. 21, National Society for the Promotion of Industrial Education.

Boston Vocation Bureau (Pamphlets describing various occupations).

Industrial Survey of Cincinnati; Printing Trades, Cincinnati Chamber of Commerce.

A Selected Critical Bibliography of Vocational Guidance, Brewer and Kelly, Harvard University Bulletin on Education.

Choosing a Vocation (Bibliography by Brooklyn, N. Y. Public Library).

#### Books.

The Vocational Monographs of the Cleveland Education Survey, Division of Education of the Russell Sage Foundation.

The Building Trades.

The Metal Trades.

The Printing Trades.

The Garment Trades.

Dressmaking and Millinery.

Department Store Occupation.

Boys and Girls in Commercial Work.

Railroad and Street Transportation.

Wage Earning and Education.

Occupations, Gowin and Wheatley.

Conditions of Labor in American Industries, Lauck and Sydenstucker, United States Census, 1910,

Volume IV, Occupation Statistics.

Labor Problems, Adams and Sumner.

The Modern Factory, Geo. M. Price.

## BUILDING A GRAND STAND AS A HIGH SCHOOL MANUAL TRAINING PROBLEM

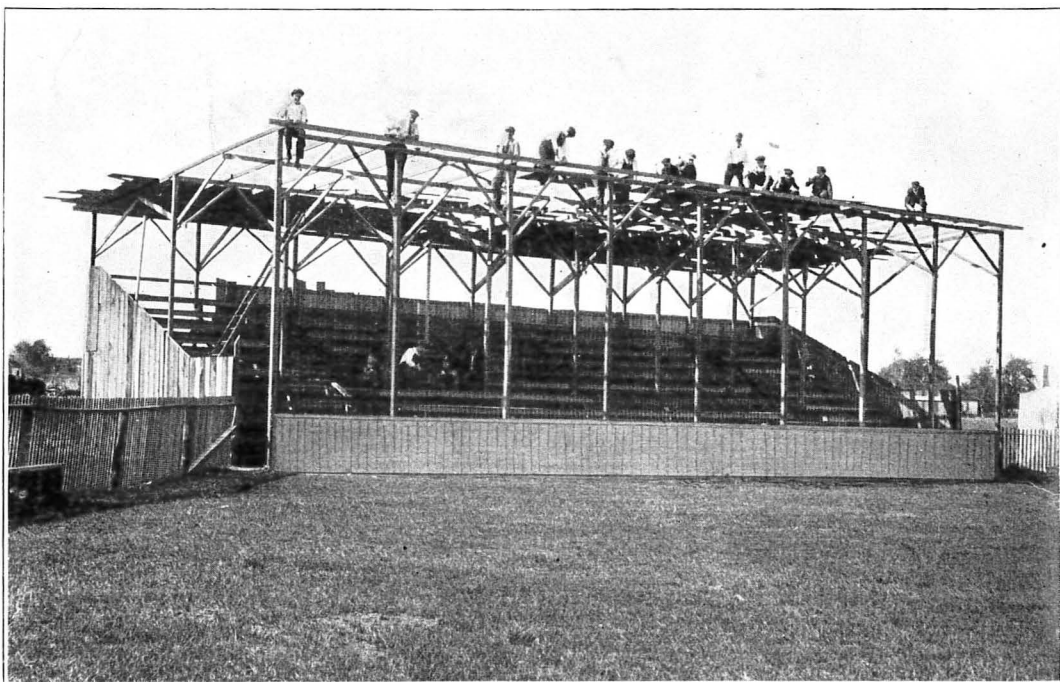
H. C. Mohler, Pana Township High School, Pana, Ill.

**I**N March, 1917, the Pana City Baseball Association made a proposition to the boys of the Pana Township High School stating that if the boys would build a grand stand on the ball grounds, the association would furnish the lumber and other materials, the boys to do the work free, and the high school to have the use of the grounds for athletic events at any time they were not in use by the association. The proposition was accepted, and with the consent of the school authorities the problem was turned over to the manual training department for solution.

The plans were drawn up and many detail sheets made by the drawing class. Much of the framing was

done at the manual training shop; forms were made for the concrete piers; and as many things gotten in readiness during the late winter as possible.

The outside work started in April and the whole class were taken on to the work. The pupils were divided into groups of three or four and a foreman appointed over each. As the work each group was doing was finished they were either given other work or placed under other foremen. The foremen were changed as often as possible in order to give all an equal chance. The natural foreman of a group would frequently develop. One of the best results of this foremanship system was the changed viewpoint of the pupil. He was able to see the pupils thru the eyes of



The Class completing the Framing of the Stand and getting ready to lay the Roof.

a foreman much in the same way that the teacher sees his pupils.

One of the foremen at one time ordered his men to do something and one of them refused to do the work, whereupon the foreman proceeded to chastise the recalcitrant. Since he was putting the oil where the squeak was, the teacher was as slow as possible in getting to the trouble to stop it.

Altho the ball grounds were over a mile from the school building, the work was all done during the regular manual training period of ninety minutes per day, five days per week. Few extra tools were needed. Many of these, such as cement shovels, etc., were borrowed from a local contractor. The contractor also loaned a man for two days to show the boys the best way to handle the concrete work.

## Some High School Problems in Modeled Leather

Leslie G. Martin, Director of Manual Training, West Henrietta, N. Y.

Leather is an excellent medium for design and handicraft work in the high school. The articles described below and illustrated on pages 108-109 have been found useful.

In making the jewel box shown in drawing, the circumference of the box is found and this distance is transferred to the leather. Then it is divided up into spaces so the repeat pattern will come out exactly even. Care must be taken while working the leather not to stretch it beyond its proper length. This would result in the pattern not matching at the ends. The box may be obtained in metal or cardboard or may be constructed. The leather is cemented to the box. The ends of the cylinder part are sewed.

The handkerchief-case is simply a leather pocket with modeled design on the top and tooled border lines on the sides. The top flap has a snap fastener. These may be obtained from dealers in craftsman's supplies. The corners and top edges of case are sewed. It is a good plan to leave a little extra leather to turn in where it is sewed.

The safety-match box cover is a small but interesting problem. It is an excellent problem on which to model individual monograms.

The blotter corners need little explanation. Leather must be left on the two sides at right angles to each other to turn under corner of blotter on pad. Interesting effects may be obtained by cutting out the design so the colored blotter may show thru.

In making round table mats care must be taken not to attempt a too complicated design on a small mat, or the result will be a fussy effect. This is something to be avoided in leather work. The designs must be adapted to the space in which you wish to place them.

The soldier's comfort bags are made of calf skin, and will hold a collection of useful articles. The complete list may be obtained from any Red Cross Chapter. It is suggested that the case be colored as

near khaki-color as possible, to be in harmony with the soldier's uniform and not be conspicuous. Flaps "D" and "B" are fastened with a small strap. The other two flaps have snap fasteners.

The music-bag contains one large pocket with flap which straps on side of bag. The handle may be purchased or made by braiding strips of leather. If a small metal or wooden bar is fastened inside the flap at top of the bag, underneath the handle, it will prevent any tendency to sag when a large amount of music is carried.

The plan for the bill-fold is given as a suggestion and may be changed to meet individual requirements. The two end flaps fold in to hold bills in place.

The photograph-case is simply two pieces of leather sewed together with openings left to insert photographs. The openings are cut to the desired size for photographs and a simple border line is tooled around the opening. It has a single fold with design on cover.

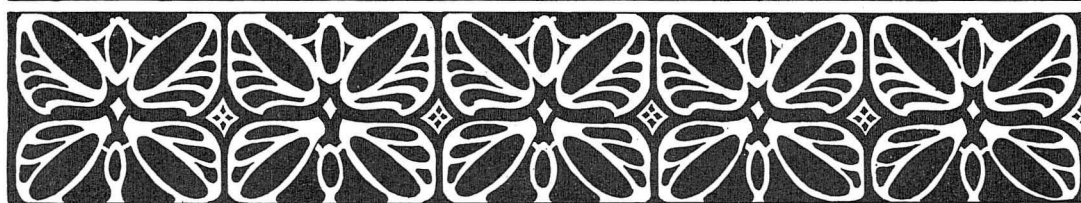
The sketch-book cover is a good problem on which to work out individual designs. When making these book covers, if a stiff cover is desired, a piece of cardboard is cut the size of cover desired, and enough leather is left around the edges of the piece which has the design on to fold over the edges of the cardboard and be cemented on under side, being mitered at the corners. Then another piece of leather is cut slightly smaller than the cardboard and is cemented on the inside, covering the edges that were folded in.

Beautiful effects may be obtained in coloring leather by first wetting the leather with water and then pouring on a small quantity of alcohol. The different dyes are then dropped on the leather and the leather is tipped different ways so the colors run and blend. This must be done quickly. Many beautiful shades of browns and greens may be obtained. A little orange run in helps to give a good effect.

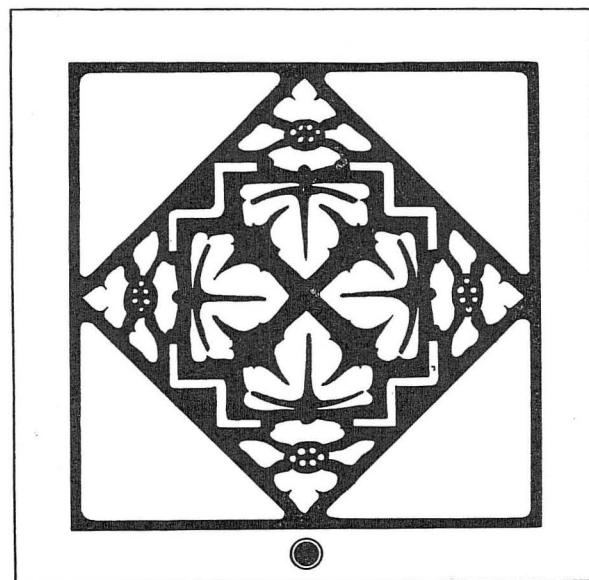
**"THE** treasury of America lies in those ambitions, those energies, that cannot be restricted to a special favored class. It depends upon the inventions of unknown men, upon the originations of unknown men. Every country is renewed out of the ranks of the unknown, not out of the ranks of those already famous and powerful and in control."—Woodrow Wilson.



# MODELED-LEATHER



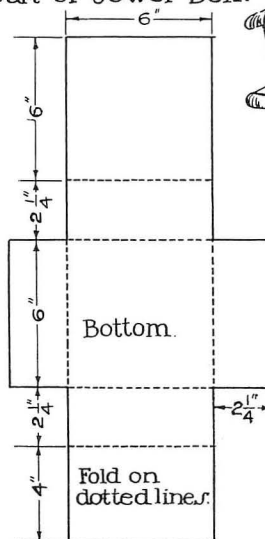
Development of pattern for lower part of Jewel Box.



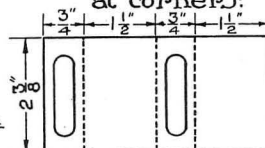
Handkerchief-Case



Case is colored dark brown.



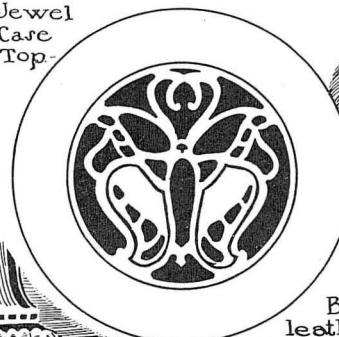
Development of Handkerchief-Case.  
6 x 6 inches—lined with  
ooze morroco. The  
case has one large  
pocket, with snap fastener  
on top flap. Case is sewed  
at corners.




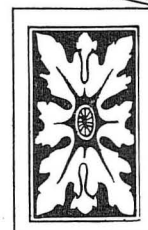
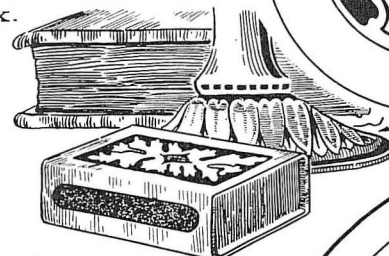
Development of Match-Box  
—Cover—

Two openings are cut to leave  
places for scratching matches  
on side of box. The two ends are sewed.

Jewel  
Case  
Top



Jewel Box  
3 1/2 inches in diameter.  
Box is lined with velvet.  
leather Has hinged cover.  Modeled leather base for candlestick.

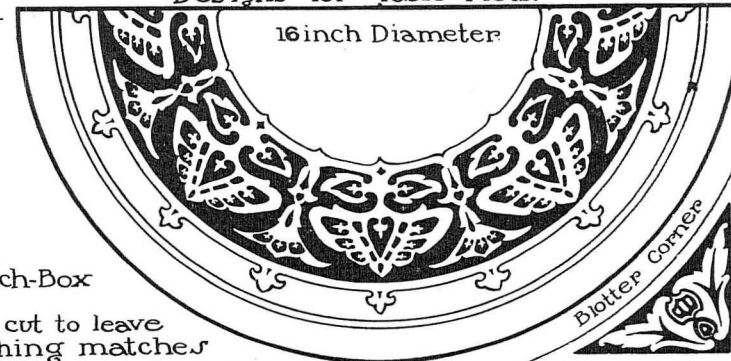


Design for  
Safety Match-  
Box Cover



18 inch Diameter

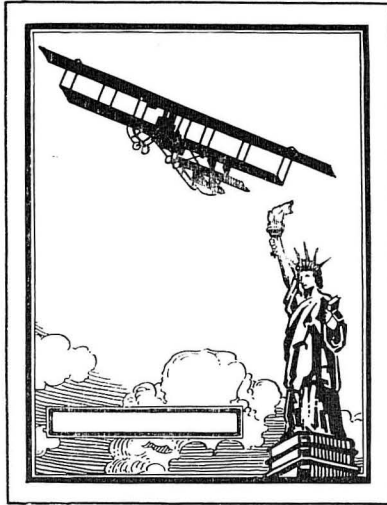
Designs for Table Mats



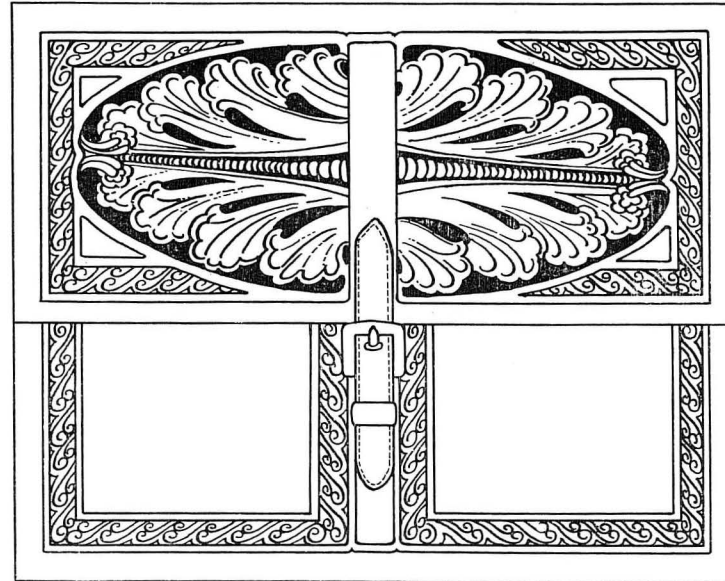
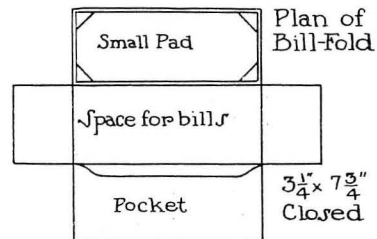
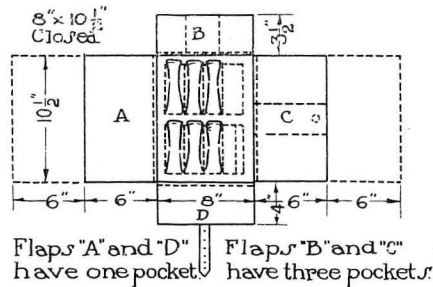
16 inch Diameter

Butter Corner

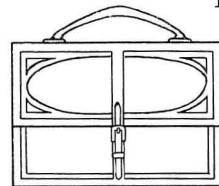
# MODELED-LEATHER



Design for Soldiers Red Cross Comfort Kits

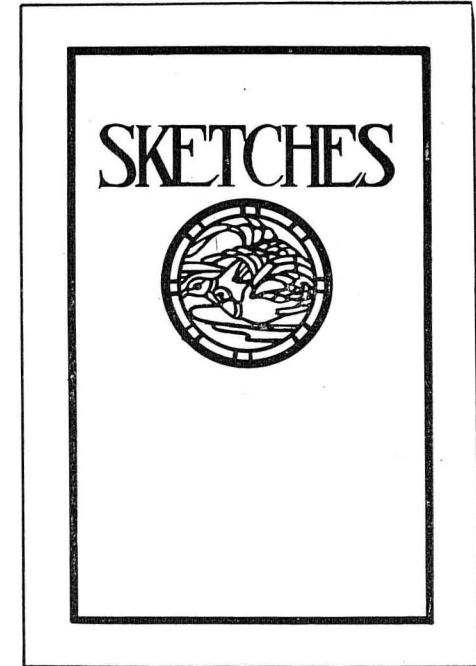


Design for Music Bag.



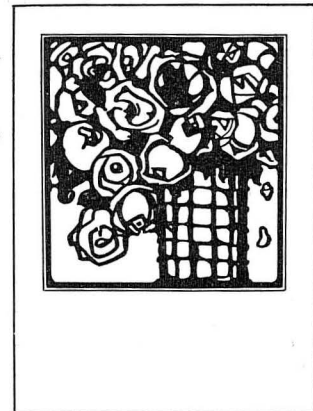
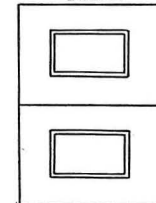
Music Bag 12" x 15 inches. - Top handle and gusset sides. Will take full size sheets of music or music-books without folding. Colored Dark Brown.

Design for Bill Fold.



Design for Sketch-Book Cover.

Photograph-Case  
4 1/4 x 3 1/8 inches.  
Case has two openings, either square or oval.  
2 3/8 x 1 5/8 inches.  
-Plan-



Leslie G. Martin.

# INDUSTRIAL-ARTS MAGAZINE

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## EDITORIAL

### ART AND THE MANUAL ARTS TEACHER.

TWO statements from Professor F. D. Crawshaw, in the February *Industrial-Arts Magazine*, should challenge attention from manual arts teachers.

"It must be evident that if manual arts are to survive as an educative means, each pupil must be given instruction in good draftsmanship, careful designing and skillful fashioning of material."

"The physical conditions for co-operation between teachers of drawing and design and teachers of manual arts in the average public school system are practically impossible."

We conceive that many manual arts teachers who have little training or interest in drawing and design will continue to be content with instruction in the making of articles from ready made designs and rest the responsibility of teaching drawing and design on the art teacher.

Even the necessary drawing and design relative to the objects made in the manual arts courses does not satisfy the need of instruction in drawing and design.

The manual arts teacher must become a teacher of drawing and design as an essential part of his work. He must be trained in these important elements of his work until he is a proficient teacher of art relative to the manual arts.

The manual arts are expressed thru form, color, texture and tone as well as thru mechanical construction. They are made to serve their purpose thru beauty of design as well as to serve their mechanical function. The manual arts teacher is clearly an art teacher and unless he is proficient the subject will not survive in the schools.

### AN IMPORTANT DEFINITION.

THE Federal Board for Vocational Education has announced in an official document, its definition of vocational education.

"To the extent that it is subsidized by the Federal Government under the Smith-Hughes Act," declares the board, "vocational training must be vocational training for the common wage-earning employments. It may be given to boys and girls who, having selected a vocation, desire preparation for entering it as trained wage-earners; to boys and girls who, having already taken up a wage-earning employment, seek greater

efficiency in that employment; or to wage-earners established in their trade or occupation, who wish, thru increase in their efficiency and wage-earning capacity, to advance to positions of responsibility."

The guiding principle of the newly created system of vocational education is announced to be that "the education to be furnished must be under public supervision and control designed to train persons for useful employment, whether in agriculture, trade and industry, or home economics."

### A NEW-FOUND FORCE AND A TARDY RECOGNITION.

THE government has been extremely reluctant to call upon the public schools for service in meeting the present crises. Among the various reasons which may be assigned for this attitude, is the one frequently voiced that the public in general has looked upon school life as a kind of dormant, incubation period after which children are supposed, without warning or symptom, to "break out" into marvelous and sundry deeds. In other words, the public has not seriously regarded the public school as a great, vital force to be used in the solution of the pressing problems that continually arise to face both the local communities and the country at large.

There are two reasons, at least, for this attitude of the public. The schools have failed in a large measure to do and to encourage the doing of service that would invite public attention and inspire public confidence. Second, the schools have only recently begun systematic campaigns for keeping the public informed as to the character and value of the work they are doing.

Recent experiences and developments have begun to bring about a radical change. The liberty bond campaigns were materially helped by the schools. The Y. M. C. A. campaign received unprecedented aid from the public schools. In the cities where marked success has been made in the Thrift Stamp movement, the success has been almost wholly due to the vigorous, organized efforts of boys and girls both in the elementary and high schools. The schools have become an influential factor in the movement for the conservation of food and fuel. The quality of work, the spirit of service, and the amazing capacity for production in the Red Cross activities have removed practically every question as to the effectiveness of the public schools as an instrument of service when important work needs to be done. The Junior Red Cross is an eloquent testimonial to this fact.

The whole country is just becoming conscious of the fact that the high schools are an almost untouched source of power and productiveness. The high school boy is now looked upon as the solution of the farm problem and many of the industrial problems arising out of the present conflict. A vigorous, young giant—a veritable Atlas has suddenly sprung into prominence.

Not so long ago, people regarded high school boys and girls as children who might not be expected to assume responsibilities and bear burdens, unmindful of the fact that the Civil War was fought by high school boys. Thru sheer necessity, America has re-discovered a tremendous power—the high school boys and girls. This discovery should, and doubtless will, have a most salutary effect upon the influence, the organization, and the curriculum of the high school. And America has learned and must never forget that the public schools can never be a negligible factor when the call comes for service in behalf of human welfare and happiness.

#### VOCATIONAL EDUCATION AND THE TEACHER PROBLEM.

NOW that all the states have decided to accept the Smith-Hughes law, they are soon to discover that it is far easier to accept the provisions of a national statute and the funds allotted thereby, than it is to put such provisions into successful operation.

One of the most important and difficult problems the various states will have to meet is the problem of securing or producing teachers prepared to give the kind and quality of work for which federal aid is designed. If under the compulsion of newborn enthusiasm or the influence of local pressure, the states undertake at once to establish vocational education in its every nook and corner, they will almost surely face immediate and disastrous failure. The wiser course would be to establish the work and give the aid in communities where large needs can be met and adequate equipment and teaching force can be secured. At the same time, every possible resource should be taken advantage of for the rapid and efficient training of a large body of teachers who should soon be able to go out into the various parts of the state and put the vocational work on a sane, practical basis. The trades themselves must furnish a large group to take this professional training.

In searching for teachers of vocational work, the fact must not be overlooked that in the ordinary manual training and household arts work there are a large number of people trained in various trades and skilled in the art of teaching, who will be able to render invaluable service in the establishment of vocational courses and schools. Very many of the manual training and household arts teachers have not had sufficient contact with actual trade work to qualify as teachers of vocational subjects. A most wise procedure for them would be to take advantage of every possible opportunity for evening instruction, and Saturday and summer employment in the lines of work in which they are best prepared. Such preparation would not only help to fit them for vocational training but would materially change the nature and quality of the ordinary shop work that is now being given in the schools. Perhaps the latter

is about as important as anything that could be done for the schools at the present time.

We are facing the critical problem of establishing a much needed type of work in our schools and of securing a body of well trained teachers to handle the work. It is very important that all possible means be used to give the new work at least a reasonable chance to succeed.

#### THE MASTER ART OF DEMOCRACY.

THE invention of movable type has long been acclaimed the greatest boon given to civilization. Today, more than ever before, printing is the greatest educational, social, political, and commercial vehicle in the world's affairs.

All the elements of design and construction, and the experience of nearly five centuries of printing, are comprised in the art of typography. Printing has been well termed "The Master Art of Democracy."

Illustration as supplementary to typography has multiplied many-fold the range and service of printing-press product. To print illustrations well is not a complete qualification as a master printer. The real measure of printing is the quality of its typography. Printing which lives, and which achieves a name for its producer, depends upon the merits of its typography.

Because of its vital part now, and its promise of still greater prominence in human affairs, the production and use of printing offer a challenge for achievement.

The printer who loves his art, and is zealous for accomplishment, must have a background of the standards of the master production. He must endeavor to employ in his own work the sound principles and vast fund of precedents open to him. The multiplicity of present-day requirements, and the almost unlimited range of material, make knowledge and skill imperative for those who would be masters in the Master Art of Typography. — *Henry Lewis Johnson.*

"Children will never be enabled to use their best powers in the service of the nation until school and industry, school and garden, school and workshop are associated allies in the task of education, with the family as third partner."—*Dr. John H. Finley.*

The man who is most often wanted for positions of trust is the one who does not work for mere selfish gain, but for the love of the task. If he does his work for love of it, and not out of consideration alone for the result, he will serve his own interests best, for he will do his work well and thereby make himself indispensable to his employer; and when the time comes to choose a man for a higher position the choice will likely fall upon him who has done his work well.—*William Howard Taft.*



# PROBLEMS AND PROJECTS

The Department of Problems and Projects, which is a regular feature of the *INDUSTRIAL-ARTS MAGAZINE*, aims to present each month a wide variety of class and shop projects in the Industrial Arts.

Readers are invited to submit successful problems and projects. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing and a good photograph. The originals of the problems in drawing, design, etc., should be sent.

Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration.

Drawings and manuscripts should be addressed: The Editors, *INDUSTRIAL-ARTS MAGAZINE*, Milwaukee, Wis.

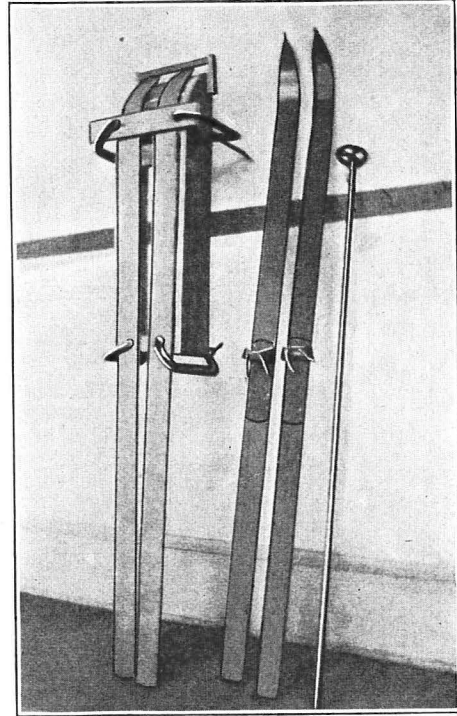
## SKI.

R. C. Shaw, Marquette, Mich.

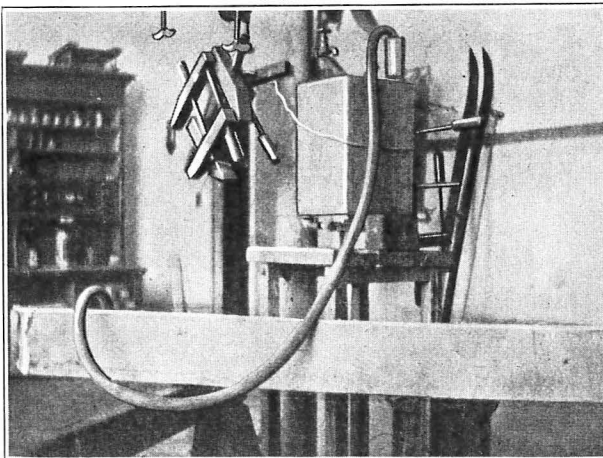
An excellent problem to interest boys in winter is a pair of ski. The material should be birch  $\frac{3}{4}$ " by 4" by 7', or as long as the boy can reach with outstretched arms. Make one edge straight and square. With the plow plane cut a  $\frac{3}{8}$ " or  $\frac{1}{2}$ " groove 14" from the front end, which should not be grooved. Measure a 12" center on the side which is not grooved and from this plane back end sloping from  $\frac{3}{4}$ " to  $\frac{3}{8}$ " thick at end. Plane toward the front end, sloping from the 12" center to  $\frac{1}{4}$ " thick at 10" from the end. The widest part of the ski is at the thinnest part, 10" from the front end, which is  $3\frac{1}{4}$ " wide. The narrowest is the back, which is  $3\frac{1}{4}$ " wide. With a straight edge mark on each side from  $3\frac{3}{4}$ " to  $3\frac{1}{4}$ ". Be careful to plane the same on each edge so as to keep the groove in the center. At the widest part of the ski which is 10" from the front end round a point leaving a tip end  $\frac{3}{4}$ " by  $\frac{3}{4}$ " by  $\frac{1}{8}$ ". The ski is then ready for steaming.

For steaming, a four or five-gallon oil can, a box 6" by 8" by 8' and a hose four or five feet long are necessary. The can should be filled about three-quarters full of water and should be connected with the box by means of the hose. The joints of the box should be painted to prevent steam from escaping. One end of the box should be closed and the other fitted with a board so it can be opened and closed easily. Steam ski four or five hours and bend quickly.

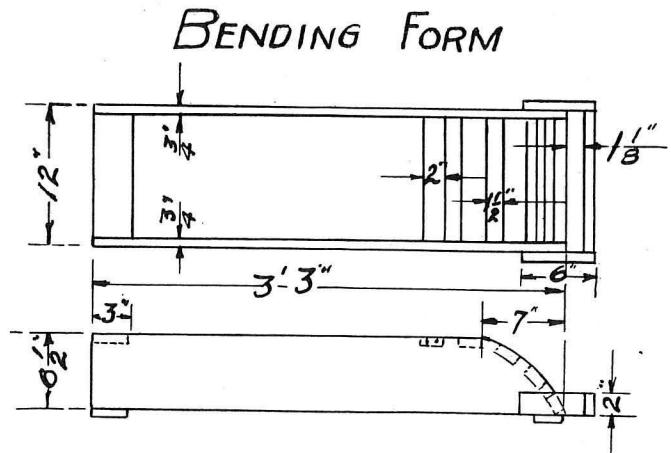
The form to bend them on is made of any kind of lumber. The drawing and the following bill of materials will make the form clear:



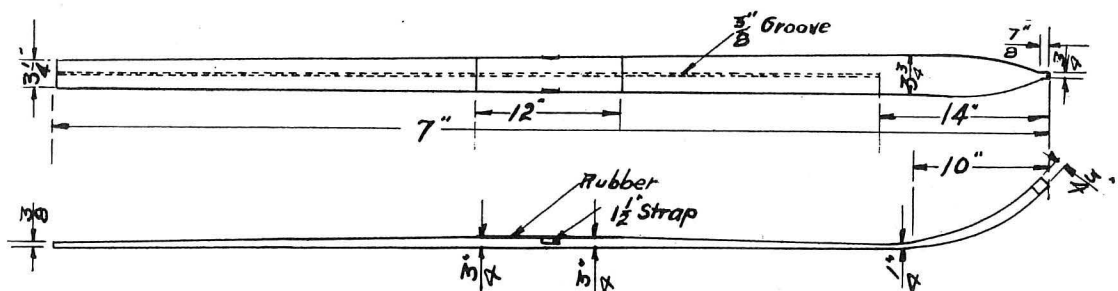
Pair of Ski in Bending Form, Completed Ski and Guide Pole.



Steaming Device consisting of Oil Can and Wooden Box.



## SKI



DETAILS OF SKI AND BENDING FORM.

2 pieces  $\frac{3}{4}$ "x6 $\frac{1}{2}$ "x3' 3"  
 4 pieces  $\frac{3}{4}$ "x2"x10"  
 2 pieces  $\frac{3}{4}$ "x2"x6"  
 1 piece  $\frac{3}{4}$ "x2"x12"  
 2 pieces  $\frac{3}{4}$ "x3"x12"

The ski should be left in the form twelve hours. After sanding, finish with one coat of linseed oil, and shellac on top with black shellac. Lines may be gauged on the edges and a small design may be painted on the front end with red shellac. Balance heavily in front. Screw on 1 $\frac{1}{2}$ "x3 $\frac{1}{2}$ " straps laced together on top.

#### RED CROSS SOLITAIRE.

C. E. Partch, Des Moines, Ia.

The accompanying drawing shows a gameboard—the idea being so old that it seems new again.

The board in the illustration is made of  $\frac{3}{8}$ " 5-ply paneling, but if that is not available a half-inch board will do as well. The holes or depressions for the marbles are made with a  $\frac{5}{8}$ " rose countersink, countersinking the holes the full depth of the tool.

The boys in the shop first made two of these boards for each Y. M. C. A. building at the Camp Dodge (Des Moines, Iowa) training camp. The girls of the domestic art department made the marble-bags needed for the boards, and the boys furnished the marbles. The first ones have been in camp about a month and since that time the boys have had several orders for more from people who want them made to send to other camps or hospitals, or to the front.

The board when finished and equipped with red marbles forms the emblem of the Red Cross. The four games that can be played on the board afford an opportunity for soldiers to busy themselves during many an idle hour, whether convalescing in the hospital or recreating in camp.

It is not necessary that the game be played with marbles

nor even with a board. A soldier, after familiarizing himself with the arrangement of the men and the object of the games, may play it on the ground with pebbles or on a piece of cardboard using pins, buttons, or matches, for men.

#### Directions for Playing Red Cross Solitaire.

I. Place 32 marbles on the board, leaving the center hole vacant as shown in Fig. 2. The object of the game is to clear the board by jumping and removing the marble jumped, leaving a single marble in the center. You are privileged to jump in any direction square across the board but not diagonally.

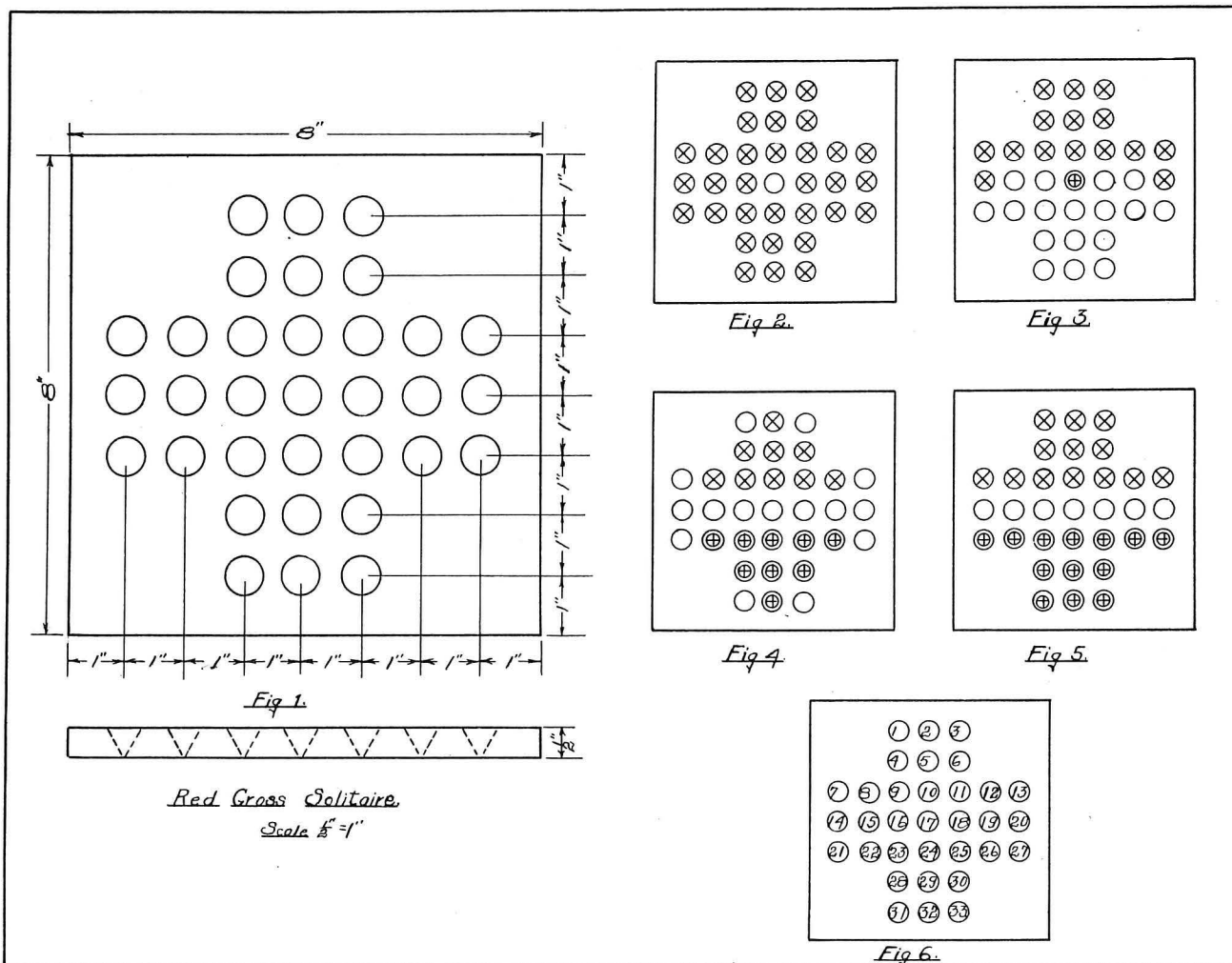
II. *Fox and Geese.* Place fifteen marbles of one color and one of another color on the board as shown in Fig. 3. The fifteen marbles represent the geese and the single marble the fox. The fox is privileged to move in any direction square across the board (not diagonally). The geese may progress forward or in either direction sideways but not backward. The fox may jump the geese, removing them from the board. The geese may jump the fox but without removing him from the board. It merely progresses the geese two holes instead of one.

The fox endeavors to capture all the geese and the geese endeavor to corner the fox so that he cannot move nor jump.

III. *Pyramids.* Place eighteen marbles on the board as shown in Fig. 4, each player having an equal number.

Each player may move forward or sideways but not backward. He may jump his opponent's men without removing them from the board. Jumping merely helps him to progress more rapidly.

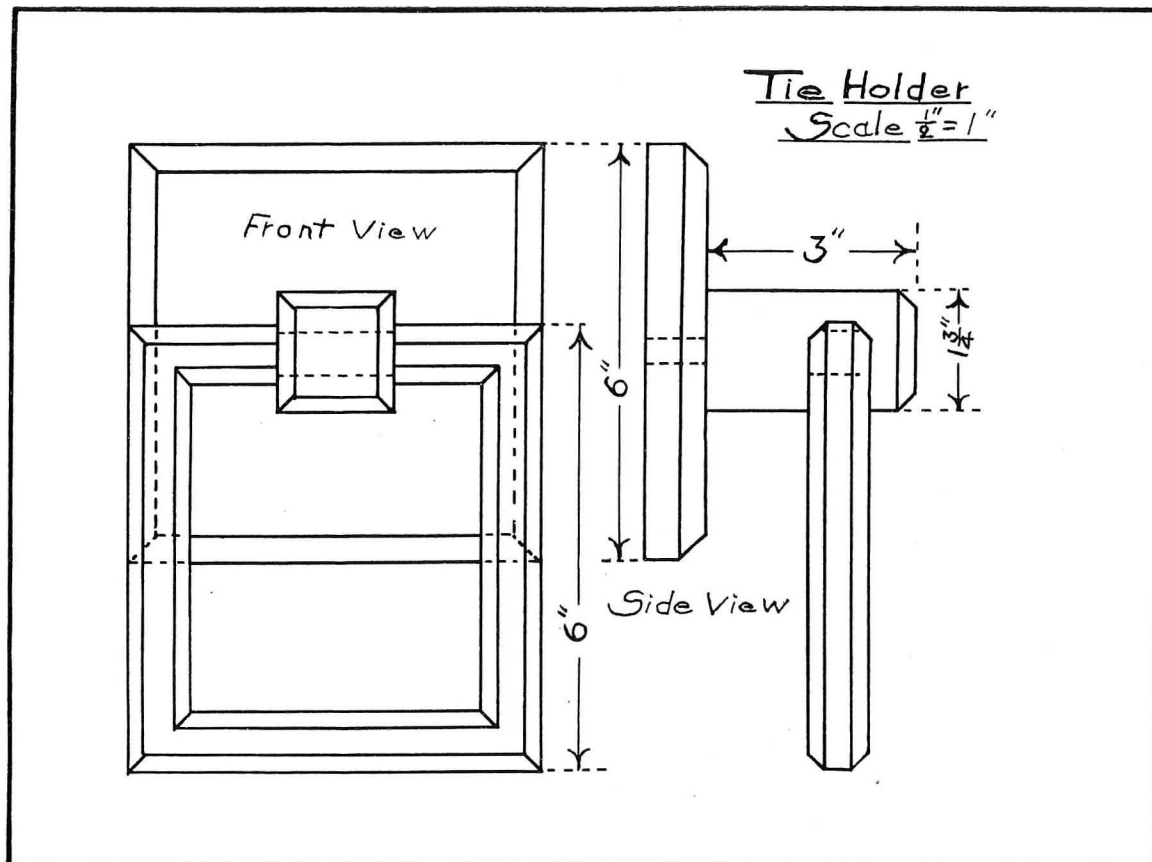
The person who first succeeds in moving his pyramid from his territory and re-forming it in his opponent's territory, wins the game.







Designed and made by students in the cabinet shop of the Kansas State Normal Training School, Pittsburg, Kans. The working drawing of the sewing cabinet is shown on page 114. The illustrations are here reproduced thru the courtesy of Mr. H. C. Given, Director of the Department of Cabinet making.



DETAILS OF TIE HOLDER.



## TIE HOLDER.

Knox F. Hutchinson, County High School,  
Fayetteville, Tenn.

A woodworking project which has created a great deal of interest. The purpose of this project is to give special training in beveling, with both chisel and plane. The interior bevels of the holder must be made by a chiseling process, while the remaining bevels may be produced by either a chisel or plane. It also involves one mortise and tenon.

This project should be made from a tough wood, as red gum. It requires two pieces  $\frac{3}{4}$ "x6"x6", and one piece  $1\frac{1}{4}$ "x1 $\frac{1}{4}$ "x4", finished sizes.

Method of inserting holder into its support: After support is complete and hole bored to receive the round tenon which is cut in the middle of top side of holder, before fastening it to base, split it as near the middle of the hole as possible. Then place the holder in position and glue support back as it was before it was split. After glue has hardened, it is ready to be fastened to base.

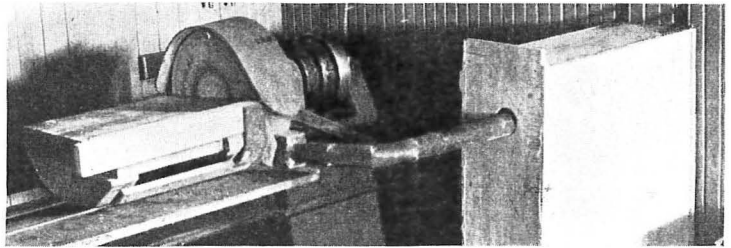
## A DISK SANDER WITH DUST CATCHER.

Louis R. Rosenberg, Oconomowoc, Wis.

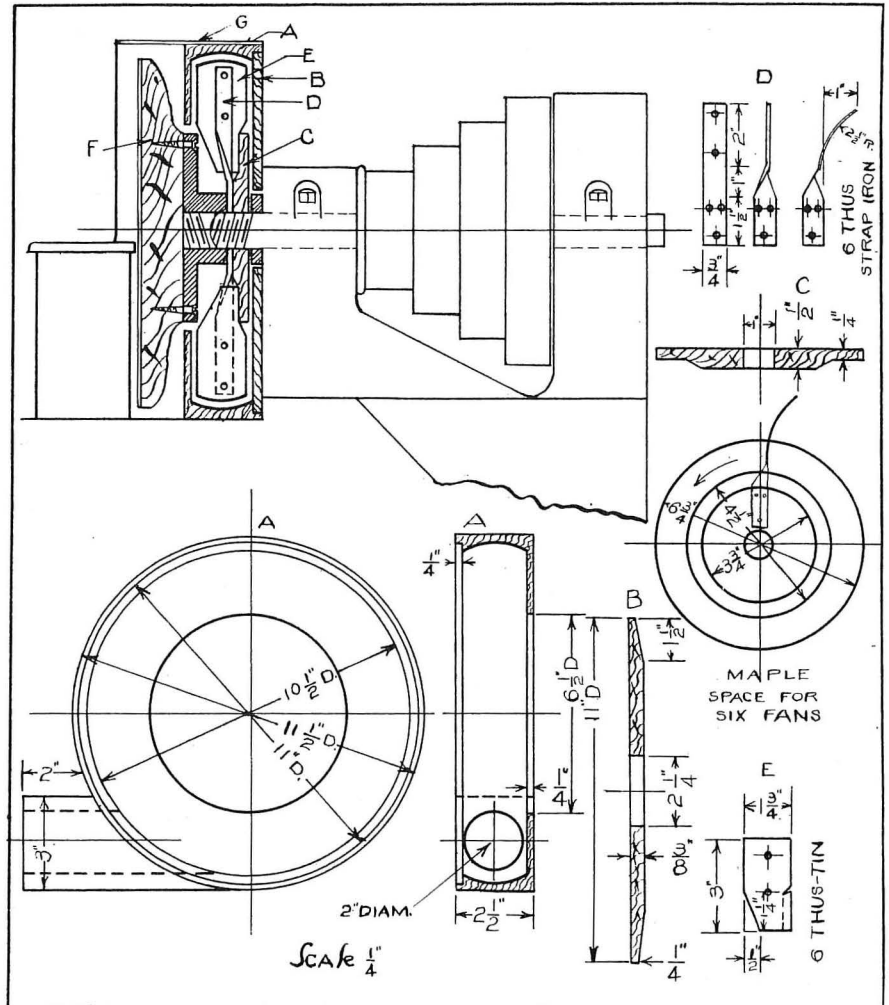
The disk sander is one of the handiest tools in the school shop. It will square pieces from the smallest up to as large as six inches square. A useful sander which the writer has used is made of soft pine about 2 $\frac{1}{2}$  inches thick and 11 inches in diameter. It is turned up on the face plate of a lathe, as shown in the drawing at F. The sandpaper, which is No. 1 $\frac{1}{2}$  garnet, is applied by means of a circle of glue one inch wide at the outside edge of the circle. By running the disk at high speed a sheet will last from two to three days.

The platform for holding work to be sanded may be made to suit individual preferences. The writer's experience has shown that one constructed as shown in the photograph is satisfactory and durable. It rests and slides on the lathe bed and is guided by an oak strip in the slot of the bed. The top of the platform is just below the center of the disk and at right angles to it.

An exhaust system was added by the writer to his disk sander. The exhaust fan is made up as at "C," and is fastened between the lathe head stock with the face plate. The fan is covered with a hood as shown at "A," glued up of soft pine and turned to dimensions. The cover, "B," for the hood is also made of pine and is held in place with screws and washers. The hood itself is held firmly in place by means of a spring on each side of the lathe head. A leather cover, "G," fits over the hood. The lower half projects outward flush with the disk and the upper half laps over the sander about one and one-half inches, as may be seen in the photograph. The ends of the covering are not fastened to the hood but overlap the front edge of the disk by one inch. The exhaust from the hood is a two-inch pipe, placed tangent to the inner circumference of the hood. This hood outlet may be turned into a dust catching box or may be simply drawn down to the floor. The dust catching box should contain at least twelve square feet of heavy bunting that will hold the dust and that will permit the air to escape freely.



The Complete Sander with Dust Catcher.



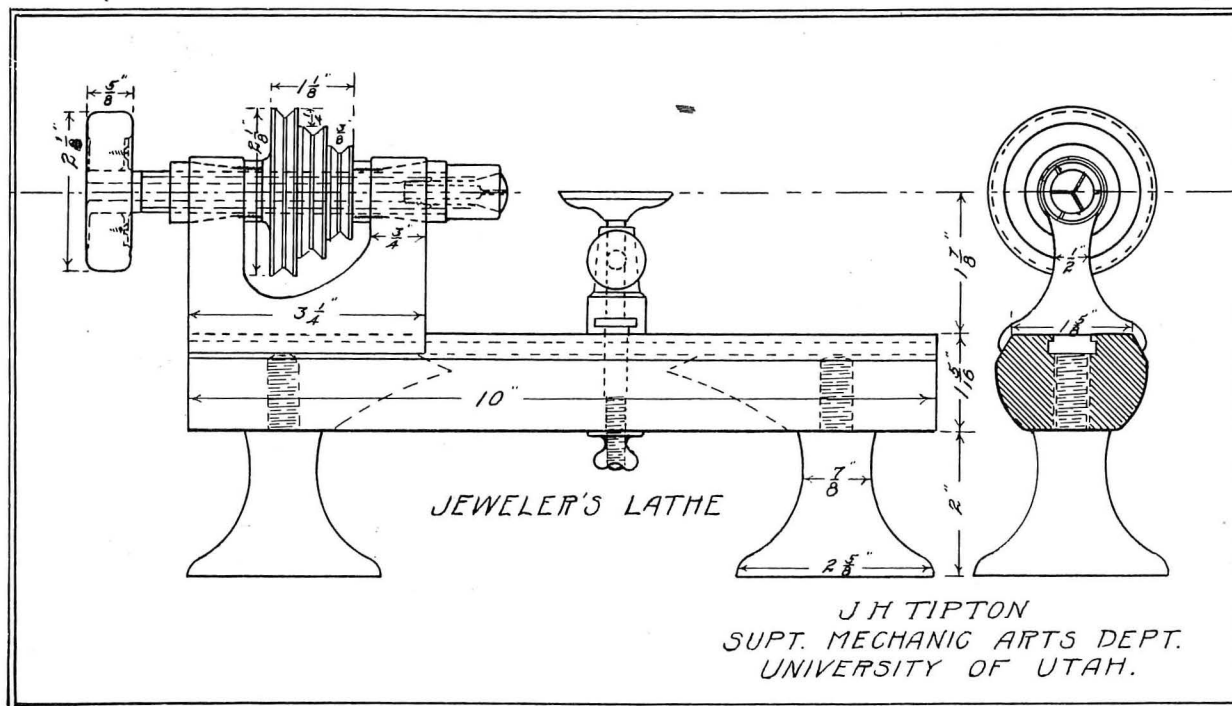
Details of Sander with Dust Catching Device.

## KNITTING NEEDLES MADE BY HAND METHOD.

(Adapted for Fifth and Sixth-Grade boys.)

H. S. Peterson, Portland, Ore.

The demand for knitting needles seems to be on the increase. So many requests for needles have come to the writer that he set about devising means for supplying the needs of the community. Dowels were found expensive and hard to get. The stock room contained some  $\frac{1}{4}$ " spruce, red cedar, redwood and douglas fir. This was ripped into  $\frac{1}{4}$ " strips and cut 14" long. Each boy ripped enough for two strips. The necessity of planing to a perfect square in cross sections was then carefully demonstrated to the class. By holding one end of the stick in one hand and laying the rest of it flat on the bench top, one end was planed octagon. By reversing ends the whole stick was reduced to an octagon. The plane must now be set to cut very fine shavings and the stick reduced to sixteen sides. A gage was made by boring a hole in a piece of thin wood. The planing was continued until the dowel would just pass thru the hole. The sanding is best accomplished by revolving the needle flat on the top



DETAILS OF JEWELER'S LATHE.

of the bench and using a sandpaper block, rubbing back and forth lengthwise of the needle.

The process has proved almost a revelation to the boy. To think that he by such a simple means and in so short a time could make a piece of wood round makes him dream of the masts he is going to make for his next boat.

Putting on the knob was even more fascinating to him than the process of making round. The average boy will think it impossible and when he sees the simplicity and the ease with which it can be done he is astounded at the part that ingenuity can play in making something old in a new way. Whether the boy sees it clearly or not will, of course, depend upon whether the man in the shop is a teacher or a foreman.

By placing a  $\frac{3}{8}$ " maple dowel horizontally in the vise, a hole is bored  $\frac{1}{4}$ " deep, in one end, the needle inserted and the dowel sawed off to make the knob the desired thickness. Glue may be used but it has not been found necessary when the needles were of fairly soft wood. The needles can then be painted, shellaced, and waxed or finished otherwise.

Many users of knitting needles prefer the wooden to the expensive celluloid needles. They are not so annoyingly slippery that there is danger of the work slipping off.

#### JEWELER'S LATHE.

J. H. Tipton, Instructor in Mechanic Arts,  
University of Utah.

The Jeweler's Lathe may be given, as a problem, to a student who has had experience in machine work.

The bed was turned up and then milled to shape, from the casting of course. The "T" slot was milled the full length of the bed. The legs were turned and screwed into the bed. The bearings are bronze, slotted, and fitted into conical holes so as to be adjustable for wear. The adjusting nuts are adjacent to the cone pulley. An ordinary jeweler's chuck is used and was purchased from a supply house.

#### A VOCATIONAL EVENING SCHOOL.

Provision has been made by the Superintending School Committee of Auburn, Me., for a vocational evening school for the benefit of shoe factory employees of this city, to take effect when approved by the state and federal authorities as coming under the requirements of the Smith-Hughes Act.

The plan for the conduct of the school includes the employment of a man who is thoroughly familiar with the manufacturing of shoes and who will spend his time during the day in the shops studying the needs of those enrolled in the school, giving them suggestions for improvement, and making clear to others the

opportunities offered by the school. In the evening he will give instruction, devoting his time more especially to shop problems. The other instructors may be selected from the day school teachers.

The courses of study correlate with the shop work and are arranged so far as possible to meet the needs of the individual employees and are both elementary or advanced according to circumstances.

The following courses are offered:

1. Business English and Letter Writing.
2. Industrial Arithmetic as Applied to the Shoe Industry.
3. The Slide Rule in Theory and Practice.
4. Mechanical Drawing Leading to Machine Design.
5. Physics.
6. Elementary Chemistry of Shoe Shop Materials.
7. Geography and History of Shoe Shop Materials.
8. Industrial and Political Economy.
9. Talks by Practical Men on Shoe Manufacturing.

#### VOCATIONAL GUIDANCE IN VINCENNES, IND.

The idea of vocational guidance that formerly obtained and still persists to some extent, that guidance concerned itself chiefly with the successful adjustment of the pupil after he leaves school, is not the conception of guidance as it is understood and employed here. True, to safeguard the welfare of the pupil leaving school, with advice, information and employment is a function of guidance but not its only use. Fully as important as this is the giving of vocational information, preparation and guidance obtained by the student as he passes thru his entire life. We regard vocational guidance as one of the distinct and basic functions of education. With this in mind it will be seen why guidance in Vincennes begins in the first grade and is continued thruout the school life. The aims of vocational guidance then as understood in the Vincennes schools are:

1. To encourage self analysis on the part of the pupil, and analysis of the pupil on the part of the teacher.
2. To stimulate and motivate school work.
3. To give the pupil a broader view of the field of vocations, the possibilities, hazards, and the rewards of each.
4. To assist him in the choice of a vocation in which to invest his powers and ability, and in the preparation for the same.
5. Since occupation is one of the primal necessities of life, to assist in a proper vocational adjustment to start at the end of his school career.
6. To teach the child to think thru estimating and weighing values toward a definite end.—J. I. Sowers.

# VOCATIONAL EDUCATION ASSOCIATION OF THE MIDDLE WEST.

That vocational education has a powerful advocate in the shape of the Vocational Education Association of the Middle West was amply demonstrated by the fourth annual convention of the association which took place on January 24, 25 and 26, in Chicago. The meeting was a "war convention" in a very true sense and both the speakers and the audiences reflected the earnestness with which American schoolmen are applying themselves to readjust education to war conditions and to "after war" situations as these appear probable at present.

President S. J. Vaughn prepared a program that has not been excelled at any convention devoted to vocational education. The speakers, with but three or four notable exceptions, were on hand at the appointed time, despite the extreme cold and the unusual difficulties in transportation. The attendance approached the one thousand mark and included large delegations from Wisconsin, Illinois, Indiana, Ohio, and Michigan. The closing of the Chicago schools made possible good local representation so that the large assembly room of the Morrison Hotel was well filled at all the sessions.

Mr. Vaughn, in his introductory address, pointed out the need for adjustment in educational efforts and argued for the most careful consideration of the two-fold duty of the schools in meeting the opportunities presented thru the enactment of the Smith-Hughes law and the duties imposed by war-time conditions. The paper laid the foundation for the entire discussions which followed. Mr. William Bachrach described the effective means which are being taken in the new Chicago continuation schools to train boys and girls to fill the vacancies caused by the withdrawal of men for military service. The schools are located in the "loop district" where they are readily accessible. Reference was also made to similar service which the night schools and the day high schools are rendering. Canada's experience in re-educating mutilated soldiers was presented, and a local army officer spoke of the probable plan which will be followed for the United States. The high point of the afternoon session was reached in the address of Prof. Arthur D. Dean of Columbia University in his discussion of the "Educational, Social and Vocational Value of Red Cross Work in Schools." Dr. Dean made exceedingly practical suggestions based on his experience in organizing Red Cross Work in New York State.

The evening session, over which Mr. C. W. Sylvester, of Hammond, Ind., presided, took up phases of vocational problems of immediate application. Mr. Burrige D. Butler outlined the purposes and scope of the "Boys' Working Reserve of Illinois" and showed that there is no intention of lowering the efficiency of the education of these boys but rather to greatly increase their opportunity for learning the practical value of labor and of social co-operation. Miss Ruth Mary Weeks spoke in her characteristically incisive way on the necessity of making American industry safe for democracy, and Dr. L. D. Harvey, president of Stout Institute, brought to bear all his wide experience and his keen insight into educational conditions in suggesting means thru which the school can be an aid to the government in the emergency of the war. Mr. Frank Duffy, secretary of the United Brotherhood of Carpenters, voiced the attitude of organized labor which he declared is especially in sympathy with all movements for vocational education that shall not be narrowing but broadening in its effect.

On Friday morning the association met in general session with the Vocational Supervision League and several other Chicago organizations. The papers brought before the members most interesting experiments in the direction of special help given to atypical children in the form of vocational guidance and special vocational instruction. Miss Anne Davis, chief vocational adviser of the Chicago public schools, told of the work which her department is doing for boys and girls who must leave at the age of 14 before completing the elementary school course. She impressed her audience with the practical character of her work and the saneness of her arguments for extending rational vocational guidance to all children. Miss Mary M. Bartelme described the remarkable success which has attended her efforts in offering



MR. ALBERT G. BAUERSFELD  
Chicago, Ill.

President-elect, Vocational Education  
Association of the Middle West.

special scholarships in vocational schools to children who have been brought to the Juvenile Court for misdemeanors of various kinds, and Miss Sophonisba P. Breckenridge described the fundamental rights of all children to vocational education opportunities.

In the afternoon session, Dr. Anna H. Talbot advanced a program for vocational education during the war period. She made a particularly strong plea for the necessity of embodying in every state system of education, efficient vocational material. Dr. Helen T. Woolley, of Cincinnati, argued the vocational aspects of the elementary curriculum and discussed the possibilities as these have become evident thru her experiments in Cincinnati.

The interest of this session was centered quite naturally in the address of Dr. John Dewey of Columbia University. In a scholarly effort Dr. Dewey pointed to the need of socializing the schools so that a greater democracy may result from the present war disturbances. He argued for compulsory training of all young men and women, not for military service but for democratic social service, and outlined the fundamentals of a plan to bring about this effect.

At the annual dinner which was presided over by Mr. Wm. J. Bogan, of the Lane Technical High School, as toastmaster, a discussion of Chicago and Illinois problems predominated. The addresses at this gathering were the only evidences of the fact that the association had been formed originally to promote vocational education in Illinois and that it has outgrown the plans of its charter members. Mr. Edwin S. Davis spoke for the Chicago board of education, and Mr. Hart Hansen described the plans of the board. Prof. F. W. Shepardson, chairman of the Illinois State Board of Education, painted a rosy picture of the future of vocational education in Illinois and described the plan of organization and the method of approach which is to be followed out in initiating the system. The place of Dr. P. P. Claxton was taken most acceptably by Dr. Wm. T. Bawden, who spoke of the service of the Federal Bureau of Education in promoting vocational education and in furthering all forms of school activity which will contribute to the success of the war. Supt. E. C. Hartwell closed the fixed program with a practical discussion of the problems and difficulties of grafting a system of vocational schools to the established school system so that it will become an indistinguishable and valuable part of the same.

The Saturday sessions of the meeting formed a splendid climax to the whole convention and in point of lively interest and enthusiasm exceeded any vocational gathering that has taken place in Chicago. Miss Anne Davis opened the meeting with an enthusiastic paper on "The Relations of Child Labor to Vocational Guidance," and made clear that the



state cannot do its full duty to the child worker or to industry unless it affords some practical guidance to the child which is going into a blind alley or is entering upon an occupation for which it is not fitted by reason of physical and mental equipment.

Miss Helen L. Sumner, assistant chief of the United States Children's Bureau, brought an informational paper on the vocational education programs which have been undertaken since the opening of the great war in 1914. She showed very clearly that France and England have suffered enormously thru the breakdown of their educational systems during the early years of the war and that they have undertaken radical reforms in self protection. She spoke of the plan by which the English children must attend a continuation school up to the age of 18 and whereby the vocational training of girls will be compulsory until that age. In France and in Germany, similar but less drastic steps have been taken for keeping children in school.

Mrs. Ella Adams Moore described the fight which has been made in Illinois for an adequate child labor law. She made clear that the progressive spirit of Illinois indicates a new program for improvement as soon as any important advance has been achieved.

The climax of the session, if not of the whole convention, came with the closing address which was made by Dr. Charles A. Prosser, director of the Federal Board for Vocational Education. In ringing sentences, Dr. Prosser described the plight of the United States Government in its lack of army and navy technicians which are of vital necessity in maintaining the fighting men at the front. As an illustration he cited the case of welding, which is an essential for repairing mechanisms in war. He showed that while Germany has 60,000 oxy-acetylene welders in active service, the United States cannot gather its needed 20,000 and cannot even supply 10,000 because there are not that number of welders in the entire United States. He declared that the United States Government would undoubtedly take over all technical and higher industrial schools after May first to prepare not less than 200,000 mechanics and technical experts for every branch of the service, particularly for the signal corps and the motor transport sections.

At a noon luncheon Dr. Prosser outlined the plans of the Federal Board for Vocational Education for introducing in the several states those vocational schools and vocational activities which are called for under the Smith-Hughes law.

At the afternoon session Mr. H. W. Kavel, of Dunwoody Institute, presented the methods adopted in the institution over which he presides, in preparing several thousand motor mechanics, bakers, sheetmetal workers, radio and buzzer operators for the government. His address took the form of a very practical, suggestive method for starting the training of men at the exact point where their previous education and experience falls short of the standard required by the naval and military authorities. Mr. Wm. M. Roberts, of Chicago, declared in his address that the Chicago schools had undertaken comparatively little in the form of war work because the military authorities apparently did not know just what they might demand of the local schools. Mr. Frank L. Glynn spoke very briefly of the most recent developments in vocational education in Wisconsin. He gave over a portion of his time to Mr. Dunn, of Green Bay, who has undertaken some practical experiments in supplying the vocational training necessary to perfect mechanics and other artisans in new forms of work made necessary thru the acceptance of war contracts.

Mr. J. W. Dietz, of Pittsburgh, spoke of the work of corporation schools in fitting men within the industries for the particular needs of the institution in which they are employed.

Dr. Charles A. Prosser closed the program by presenting the history of federal legislation for vocational education. He made clear that it will be the policy of the Federal Board to carry out all provisions of the Smith-Hughes law and that there will be no interference with local initiative or local enterprise. He pointed to the fact that all provisions in the law are the result of practical needs and that criticisms of the law are untimely and unwise. He declared that the Federal Board and its agencies will work thru the respective boards which are supreme in their respective commonwealths, and that what influence the Federal Board wields will be

entirely thru co-operation and conference. At the close of the meeting the following officers were elected:

President, A. G. Bauersfeld, Lane Technical High School, Chicago; Vice-President, J. W. Dietz, Western Electric Co., Chicago; Secretary, Mrs. Mary D. Bradford, Kenosha, Wis. Directors: S. J. Vaughn, State Normal School, De Kalb, Ill.; Supt. Wm. A. Greeson, Grand Rapids, Mich.; Mrs. Helen T. Woolley, Cincinnati, O.; Arthur D. Dean, Albany, N. Y.; C. W. Sylvester, Hammond, Ind.

#### A NEW PLAN FOR INDUSTRIAL EDUCATION IN THE GRADE SCHOOLS.

A. R. Nichols, Corvallis, Ore.

A great deal is being said about efficiency in all lines of work, and it seems to me it is time we were making some application of it to our school work. We have been going on as others have done, having our grade-school boys take one and one-half hours of shopwork per week, knowing full well that they lost track of their work between times and therefore all interest in it. This has been so long established that we thought there was no other way. In getting the equipment ready for our work this fall I found that to follow the old plan we would need to buy more equipment. So it was a question of buying new equipment at war prices or change our plan of conducting the work.

The latter seemed the most feasible at this time, so instead of having the boys come eighteen times in eighteen weeks, we changed and have one class come for eighteen consecutive days. It is hard to estimate the difference in the efficiency of the two plans with so short a trial (this semester) yet for the time we have tried it we think we are accomplishing three times the results that we had before.

These results are shown not only in the quantity and quality of the work turned out but in the even more important item, the effect upon the boy. It is no longer "Manual Torture," but the question now asked is "May we come this way all the term?"

With only one class using the shop for the eighteen days it takes less drawing boards, T-squares, and triangles and the question of boys in one class getting the projects mixed with those of another are eliminated. The question of materials is much more easily solved.

The girls in the same grades go to domestic science and art classes at the same time that the boys go to the shops, and these teachers report even better results than were anticipated.

I believe that this plan, if given a fair trial, will prove the most economical and efficient way of handling industrial education in the grade schools.

#### OREGON TEACHERS MEET.

The Manual Training Section of the Oregon State Teachers' Association met at the Lincoln High School, Corvallis, on December 28th. The meeting was called to order by Supervisor L. L. Summers, of Portland.

The first topic discussed was, "The Value of Printing in the Public Schools as an Educational, Industrial and Pre-vocational Subject." Mr. Orley W. Athey, of Portland, read a very interesting paper, showing the close relation between printing and the English, mathematics, and arts departments of the public schools. He spoke of the little town of Drain, Oregon, where the public school is publishing a paper, the only one in the town, and receiving the united support of the community. "Possibilities of Work in Manual Arts and Vocational Education Under the Gary Plan in Our High Schools" was discussed by Mr. G. R. Bonnell, of Salem. He pointed out the many ways in which boys in shops can do work for the school district at odd times and yet not interfere with the regular work.

At six o'clock the banquet and round-table discussion took place at the Hazelwood. Mr. A. R. Nichols, of Corvallis, Oregon, as toastmaster called on Mr. L. L. Summers, who discussed the general topic, "The Manual Training Schools Co-operating with the National Government in Time of War." Mr. F. H. Shepherd, of the Oregon Agricultural College, discussed the same subject.

Mr. B. W. Johnson, Federal Agent for Industrial Education, who was present, gave a splendid talk, and Mr. Frank M. Leavitt, Assistant Superintendent of Pittsburgh, Pa., gave two addresses at the general assemblies and several talks to the section meetings.—A. R. Nichols.



### SCHOOL CRAFTS CLUB MEETING.

The School Crafts Club of New York, which met on December 15th, held three round-table conferences—one on manual work for special classes, one on pattern-making and one on continuation schools. Mr. Edward D. Griswold, who spoke at the first round table, discussed the work accomplished in public schools in the classes for atypical children, foreigners and over-age pupils. He showed the necessity for some form of motor training for pupils in special classes and pointed out the varied possibilities of wood construction for teachers of special classes. Basketry, chair caning, brush making, rug weaving, cobbling and mattress making, in Mr. Griswold's opinion, offer excellent hand training and lead to future life vocations. Farming as practiced by the Custodial Asylum at Rome, N. Y., has been especially successful in that it has more than paid the expenses of the inmates of this institution. Finally, it was recommended that some form of manual work be taught to mentally retarded children that will produce a commercial product and make self-supporting citizens.

At the second round table, the subject of pattern making was discussed in regard to its aim, methods and final results. The principles of the subject were taken up, followed by a study of methods for training apprentices and the results as observed in class teaching. Mr. H. K. Baumwitter showed a model of a fireless cooker made by a seventh-grade class in his school. Attention was given to the conservation of food as effected by the cooker.

At the round table on continuation schools, the purpose, advantages and problems of this type of school were discussed. It was the concensus of opinion that it would not be wise at present to suggest any change in the employment of groups of workers as found in the industrial and commercial centers. The fixing of a definite course of study is considered as rather difficult since the needs of each plant vary so greatly. In studying the continuation school from a vocational viewpoint as related to present war needs, attention was given to terminology, types of schools, need of schools, advantages and methods of instruction—R. A. Loomis.

### MAKING RED CROSS NECESSITIES.

*To the Editors:*

A letter of mine dated August 28 last, in reply to an inquiry from you, told what our schools had been doing for the Red Cross and what we expected to do this year. You printed this information and it led to inquiries from manual training men in various parts of the country, asking me for definite suggestions.

In your January issue the leading article by Mr. Hopper, of Plainfield, N. J., is devoted to the Junior Red Cross work. The statement is made that certain articles, including splints, are urgently needed.

Some weeks ago we stopped our preparations for the making of splints and crutches upon being informed by the Red Cross authorities here that they did not desire the schools to furnish any more of them. We had helped in the preparation of specifications for splints, which were to be included in a manual which the Junior department of the Red Cross expected to send out to the schools of the country. As issued, under date of December 10, this Manual on War Relief Activities for Schools makes no mention of splints and crutches or of other really suitable work for older boys. It suggests that they might make articles for sale, thus raising money to purchase materials to be used by the girls.

I am bringing this matter to your attention because the interest of many manual training men has been centered in work which older boys could do, and it would be unfortunate if their enthusiasm and that of their boys is dampened by discovering that the articles they have made cannot be used by the Red Cross.

Very truly yours,

J. A. CHAMBERLAIN,  
Supervisor of Manual Training.

Washington, D. C., January 12, 1918.

### RANGE MANUAL ARTS MEETING.

The Range Manual Arts Association held its annual meeting December 8th at Gilbert, Minn. Mr. M. B. Elson, president of the association, presided. Previous to the meet-

ing proper, the visitors made a trip of inspection to the various Gilbert school shops, which was followed by a lunch in the high school cafeteria.

Supt. C. L. Newberry made the address of welcome. He was followed by Supt. R. E. Denfield, who demonstrated how manual training can be made of most service to the schools. Supt. C. H. Barnes talked on "Industrial America After the War," and Wm. Noyes spoke on "The Junior High School and Industrial Education."

### PRINTING TEACHERS CONVENE IN NEWARK, N. J.

The executive committee of the Eastern Section, International Association of Teachers of Printing, has decided to hold the annual convention of the section in Newark, N. J., on March 25 and 26.

The officers of the Eastern Section I. A. T. P. are: President, R. Elmer Throssell, Newark, a former vice-president of the Newark Board of Education; Vice-President, C. W. Betts, Hampton, Va.; Secretary, Ralph A. Loomis, Jersey City; Treasurer, John E. Mansfield, Hawthorne, N. Y.

### NEW YORK CITY NEWS.

Fifty-nine shops located in various elementary schools, City of New York, were closed on Jan. 14 to remain so till Feb. 5, 1918.

This action of the school authorities was a result of conferences between President Arthur S. Somers of the Board of Education and the Fuel Administrator, who together decided that the best interests of all would be served by the closing of certain school buildings and having the grades of the 7th and 8th years of these schools report to a central school, where instruction could be continued, thus effecting a considerable saving in coal.

Practically all shop teachers, both regular and substitute, serving in schools affected by this order were used in the "centers" to which their respective schools reported, or under exceptional conditions were allowed to hold sessions in their own shops with 8B boys.

### Teacher of Shopwork Elected to the Legislature.

Hon. Albert Link, member of the Committee on Education and Social Welfare, New York State Legislature, is a teacher of shopwork in P. S. 10, Brooklyn, and an active member of the Associated Teachers of Shopwork, City of New York.

The confidence of a community is generally expressed in election returns. It is of interest to note the increasing amount of recognition being given teachers of manual training, industrial arts and shopwork.

### Better Salaries for New York Shop Teachers.

One of the last important acts of the outgoing Board of Education of the City of New York, composed of 46 members, was the approval of several very important recommendations by the Board of Superintendents, one of which provided for amendments to the salary scales for teachers of shopwork in elementary schools. The minimum has been raised from \$900 to \$1,100, and the maximum, from \$1,900 to \$2,100. The annual increment of \$100 remains the same in the amended schedules.

Substitute teachers of shopwork are to receive \$5.00 per day instead of \$4.00 as formerly.

This salary and wage increase is already showing its good effects in a most commendable way. Better candidates are making application to participate in the examinations.

Thirty-five candidates took the examinations on Jan. 15, 1918, for license as substitute teacher of shopwork, City of New York. The following trades were represented: Carpenters, 19; pattern makers, 6; cabinet makers, 5; school trained men with teaching experience, 3; ship joiners, 2.

A class for men, to train army cooks, has been opened in Bushwick Evening Trade School. This is the first class of this kind in New York City.

Several hundred men have already enrolled for study in the Shipbuilders' Evening Training School at Port Richmond, Staten Island, N. Y. A detailed census of all shipbuilders and ship repair laborers in Brooklyn is now being made under the direction of the industrial division of the State Department of Labor. This is preparatory to the establishment of other shipbuilding training courses. These courses are for men who have had some experience in shipbuilding trades and are planned to enable those who complete the work to qualify for higher positions.

Mr. Lewis Wilson, Director of Industrial Education of the State of New York, is supervising these courses.

# NOW, ARE THERE ANY QUESTIONS?

This department is intended for the convenience of subscribers who may have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from persons who are competent to answer. Letters must invariably be signed with full name of inquirer. All questions are numbered in the order of their receipt. If an answer is desired by mail, a stamped envelope should be enclosed. The privilege of printing any question and reply is reserved. Address, *Industrial-Arts Magazine, Milwaukee, Wis.*

## Free Copies of Drawing Books.

741. Q.—Please give me the names of several firms publishing drawing books and other works on art and design suitable for the grades and high school. I particularly wish books that are well illustrated and have working drawings that can be used for illustrative purposes.—C. J.

A.—This question is a composite of requests that come to us from time to time from subscribers. While we appreciate the writer's frankness, we believe these requests involve a practice, followed by many drawing and art teachers, that is unethical and wholly unfair to schoolbook publishers.

Schoolbook publishers invest thousands of dollars in the preparation and publication of schoolbooks and place a low price on them with the expectation that they will be used in the hands of children. If "primers" were to be used by teachers only, they would cost one dollar instead of twenty-five cents, owing to the limited sale of teachers' books.

In the case of drawing books and books on art, the practice is particularly unethical and unfair because these books are made up largely of illustrations and working drawings for which the publisher has spent thousands of dollars. In most cases, the ideas presented in drawing books are original with the author and copyrighted by the publisher for the benefit of the author who receives a royalty on all copies sold. In appropriating these drawings, teachers are unconsciously doing an injustice not only to the publishers but to their fellow teachers who are authors of the books, by depriving them of their legitimate royalty income.

It is a grave question, also, whether they are not doing the children an equal injustice by depriving them of a regular textbook as a guide in their work. It is doubtful if any superintendent would permit a teacher of grammar or arithmetic to appropriate material in this way and present it to the children as her own in typewritten or mimeograph form.

Schoolbook publishers cannot afford to invest \$25,000 to \$50,000 in a series of art books and place a low price on them unless children are going to use them as textbooks. The fact that schoolbook publishers are generous enough to send sample and complimentary copies of their publications to art teachers does not relieve teachers of their obligation to recognize not only the rights of the publishers, but the rights of the authors in the copyright material of the books. The commercial injustice, however, is quite outweighed by the educational harm done the children by attempting to present information to them in the scrappy and impracticable method followed by teachers who attempt to supervise the work in art in an entire city without textbooks in the hands of children.

## Golden Oak Finish.

761. Q.—How is the Golden Oak wax finish obtained on the furniture which is so popular at present?—A. V. L.

A.—The Golden Oak which is referred to by the correspondent is the standard Office Golden Oak finish which has come into vogue in the past two years and probably was originated by the Horrocks's Desk Company of Herkimer, N. Y. To enable him to attain the finish in question he should mix the following materials in the order given and handle exactly as a filler should be used, since it contains not only staining material but pore filling material as well.

Mix in the order given one quart of turps, one pound of raw sienna, one-quarter pound raw umber, one-half pint dark Japan drier, one quart of raw linseed oil, one-half pint of black asphaltum varnish, two pounds of silex or Wheeler's light wood filler. This should be thoroly mixed and the colors used should be ground in oil. The wood should be well sanded before using, as this material will not raise the grain, and in applying should be brushed on across the grain with a short heavy brush and allowed to set or dry until the turpentine has lost its gloss. Care should be exercised to avoid covering too much territory, since the excess filler should be rubbed off across the grain with a handful of burlap.

Supposing the piece to be a desk, it would be best to start with the inside panels facing the portion commonly occupied by the legs and feet of the person using the desk. Fill, rub in, clean off and pick out all edges and corners before proceeding to stain and fill the end panels, side panels and front in the order given. In cleaning out edges and corners, a piece of maple sharpened into a long round point on one end and a half-inch thin skew chisel on the other will be found an admirable tool for this work. Following the use of the burlap, the entire surface should be carefully gone over with a piece of unbleached muslin or similar cloth. These cloths should afterwards be washed out in gasoline and soap and water as separate solutions in order that they may be used over. Cloths improve with constant use and washing in that they lose their lint and increase their power of absorption. The filler coat should be allowed forty-eight hours to dry and should then be followed by a very thin coat of orange shellac from stock which has been reduced one-half with alcohol. After drying three hours or more this should be sanded smooth with 00 paper, dusted off and transferred to a warm, clean room with a freshly sprinkled floor and given a well brushed out coat of varnish.

In applying stain or varnish, for convenience sake it is always well to remember the rule to start with the thing you see the least and end with that which you see the most, also it is well to disassemble as much as possible all cabinet work before varnishing in that the pieces can be handled more quickly, hinges and other trim are not allowed to fill up with varnish nor will the edge of a door or drawer, for instance, catch the edge of the brush, cause a sag or drip to appear on the frame.

In varnishing a panel, work with a fairly dry brush and cover all of the edges of the panel first. Pick up a brush full of varnish, lay on across the grain of the wood as rapidly as possible and finish with the up and down stroke, following the grain of the wood. Strike the brush across the edge of the panel or, better, on a wire which has been stretched from nail to nail. This will remove excess varnish and bubbles. Hold the brush lightly in the fingers and very quickly and lightly tip off any bubbles or sags which may show on the panel. With a small amount of varnish, varnish the top and bottom cross rail, being careful not to cause a sag in the panel corners, and then carefully varnish the front and back legs, starting with the lower inside space of each leg before doing the portion facing the operator. If some such system as this is followed in laying out the work, much trouble may be avoided. Each coat of varnish should be allowed three days to dry in a warm room and should then be sanded, free from gloss and nibs, dusted off and carried back for re-coating. The third and fourth coats should be rubbed off with water, felt pad and pumice stone until a perfectly smooth surface is obtained. Sponge clean, wipe dry and clean up with a good oil polish, wiping off all excess of latter with a fresh, clean cloth.

The wax finish to which your correspondent refers is simply a selling term which seems to be popular with the retail tradesmen and has no bearing upon the actual method of finishing the work.—Ralph G. Waring.

## Farm Problems.

762. Q.—Please name books containing farm problems.—J. A.

A.—The following books contain small problems for the making of useful articles used about the farm and in the farm home: *Roehl's Agricultural Woodworking*, \$1.08, Bruce Publishing Co.; *Blackburn's Problems in Farm Woodwork*, \$1, Manual Arts Press; *Brace's Farm Shopwork*, \$1, American Book Co.; *Handy Farm Devices and How to Make Them*, \$1.50, Orange Judd Co.; *Farm Appliances*, \$0.50, Orange Judd Co.; *Farm Devices*, \$1, Orange Judd Co.; *Bulletins (Cypress Library) of the Southern Cypress Association* (free), New



Orleans, La.; *Farm and Home Mechanics* (free), Southern Pine Association, New Orleans, La.; *A Hundred Handy Helps for the Farmer and His Home* (free), Southern Pine Association; *Dewey's Series of Farm Projects*, L. C. Dewey, Denver, Colo.; *Ramsower's Equipment for the Farm and the Farmstead*, \$2.25, Ginn & Co.

#### Small Buildings.

The list below includes plans for various types of small farm buildings that may be erected by boys: *Roehl's Agricultural Woodworking*, \$1.08, Bruce Publishing Co.; *Powell's Farm Plans and Out Buildings*, \$1, Manual Arts Press; *French & Ives' Agricultural Drawing and the Design of Farm Structures*, \$1.25, Manual Arts Press; *Farm Buildings*, \$2, Manual Arts Press; *Eckblaw's Farm Structures*, \$1.75, Macmillan Co.; *Hopkins' Modern Farm Buildings*, \$3, Webb Publishing Co.; *Poultry Houses and Equipment*, \$0.25, Webb Publishing Co.; *Poultry Houses and Fixtures*, Reliable Poultry Journal; *Making a Poultry House*, \$0.50, John McBride Co.; *Fiske's Poultry Architecture*, \$0.50, Manual Arts Press; *Practical Country Buildings* (free), Northern Hemlock and Hardwood Mfrs. Association, Oshkosh, Wis.; *Swine Houses* (free), (Trade Extension Department), National Lumber Mfrs. Association, Chicago; *Poultry House Construction*, \$0.05, United States Department of Agriculture; *Plans and Suggestions for the Arrangement of a Modern Milk House*, (Farm Products Division) Borden's Condensed Milk Co.; *Eckblaw's Grain Storage Buildings*, National Lumber Mfrs. Association; *Eckblaw's Implement Sheds*, National Lumber Mfrs. Association; *Construction of the Dairy House*, Bulletin of the University of Illinois; *Hog Houses*, \$0.05, United States Department of Agriculture; *Smaller Farm Buildings*, Southern Pine Association.

#### Barns and Larger Buildings.

*French & Ives' Agricultural Drawing and the Design of Farm Structures*, \$1.25, Manual Arts Press; *Farm Buildings*, \$2, Manual Arts Press; *Eckblaw's Farm Structures*, \$1.75, Macmillan Co.; *Hopkins' Modern Farm Buildings*, \$3, Webb Publishing Co.; *Radford's 20th Century Barn Plans*, \$1, Radford Architectural Co.; *Frudden's Farm Buildings*, \$1, W. T. Comstock Co.; *Small Country Houses—Their Repair and Enlargement*, \$5, Chas. Scribner's Sons; *Shaver's Practical Barn Construction*, \$1, David Williams Co.; *How to Build the Wooden-Hoop Silo*, Alabama Polytechnic Institute; *Home Made Silos*, \$0.05, United States Department of Agriculture.

#### Problems in Concrete.

*Concrete in the Barnyard*, Universal Portland Cement Co.; *Small Farm Buildings of Concrete*, Universal Portland Cement Co.; *Concrete Silos*, Universal Portland Cement Co.; *Concrete Construction for Rural Communities*, \$2, McGraw-Hill Book Co.; *Hansen's Concrete Silos*, \$1, Cement Era Publishing Co.; *Concrete Fountains and Lawn Ornaments*, \$0.50, N. W. Henley Publishing Co.; *Campbell's Concrete for Home and Farm Shop*, \$0.75, N. W. Henley Publishing Co.; *Kind's Silos*, \$0.50, Webb Publishing Co.

#### Fuming Oak.

770. Q.—We should like very much to obtain some information about the "fuming" process, as it is carried on in the best factory furniture. What further finish usually follows the fuming process itself, and how is it best applied to produce the common "fumed oak" furniture finish?—H. W. C.

A.—In replying to this correspondent's question regarding information on the fuming process as carried on in the factories, I must say that as an engineer engaged in the study and installation of finishing systems in factories, that it is not possible for me to divulge definite methods or formulae which I have developed while in their employ. The methods as well as the finishes are generally protected by letters patent and are, therefore, factory property.

I will, however, suggest that the method consists in the application of certain organic acids to the wood, subsequent drying, and treatment with the fumes of ammonia in a slightly moist atmosphere for a definite length of time; followed by careful sandpapering and coating with materials

generally applied with a spraying outfit. As a substitute method for shopwork, however, I will suggest that the material to be fumed be coated with a solution made from tanning material which may be bought from any wholesale drug house. This is generally a dark brown molasses-like material and consists of the condensed extract from boiled chestnut chips.

In order to produce the color a small portion of the extract is mixed with water in the proportion of one part acid to four, six or eight parts water, depending upon the depth of tone desired. By varying the amount of dilution any shade desired may be obtained. The wood should be allowed to dry thoroly after the solution has been brushed on with a rubber set bristle brush, or sponge. Constant care must be exercised that the solution does not come into contact with iron or tin at any time, otherwise ferric tannate will be formed, resulting in black stains thruout the work. Extracts or solutions must be kept in glassware or earthenware.

After the reduced stain has dried, the piece must be put into some form of closed box and subjected to the fumes of ammonia contained in a wide, shallow trough or pan. A quart of ammonia of 28° strength is sufficient to fume in a box the cubical contents of which approximate 150 cubic feet. The result secured seems somewhat better and brighter if a small amount of steam is allowed to run into the box, just enough to slightly moisten the atmosphere. In the factory this is secured by a half turn of the steam cock from one to two minutes' time, depending upon the size of the box, which generally averages 800 to 1,000 cubic feet. The material should be left in the fumes for a period of about twelve hours. As, for instance, a box charged at about five in the afternoon should be opened anywhere from seven to nine the following morning.

The piece should be carefully sanded with fine paper and if time is no object, may be coated with raw linseed oil reduced two-thirds with turpentine with about five per cent drier added. This should be well rubbed in and allowed three days to dry. Follow with two coats of orange shellac, reduced one-half with alcohol, dry three hours and sand between coats with 00 or 0000 paper. After dusting off apply one or two coats of good varnish in a warm, dust-free room. Fumed oak should not be filled or an entirely different finish is obtained. The omission of the oil coat may be desirable to some as it produces a somewhat different cast to the color than that obtained with the orange shellac alone.

Fumed oak should not be finished in a gloss varnish and in case such material is used, should be carefully rubbed down with 00 steel wool, after thoroly sandpapering with the same grade of paper. After dusting off thoroly clean up with a good oil polish and rub dry.—Ralph G. Waring.

#### PUPILS FOUND ART SCHOLARSHIPS.

The pupils of the art departments of the New York City high schools have raised funds thru the sale of their art products to defray the cost of industrial art scholarships for talented graduates. This form of scholarship is one that has been pleaded for for years by Dr. James P. Haney, director of art in the high schools. The pupils have come to his support, and, with the co-operation of art teachers, have organized bazaars to which the students have contributed their own art work.

The results of these sales of student work have been encouraging. In a two-days' sale recently held, the Washington Irving High School cleared over four hundred dollars. The Manual Training High School secured two hundred dollars from a similar sale, while Bushwick High School, Jamaica High School and other schools were able to make substantial additions to their scholarship funds.

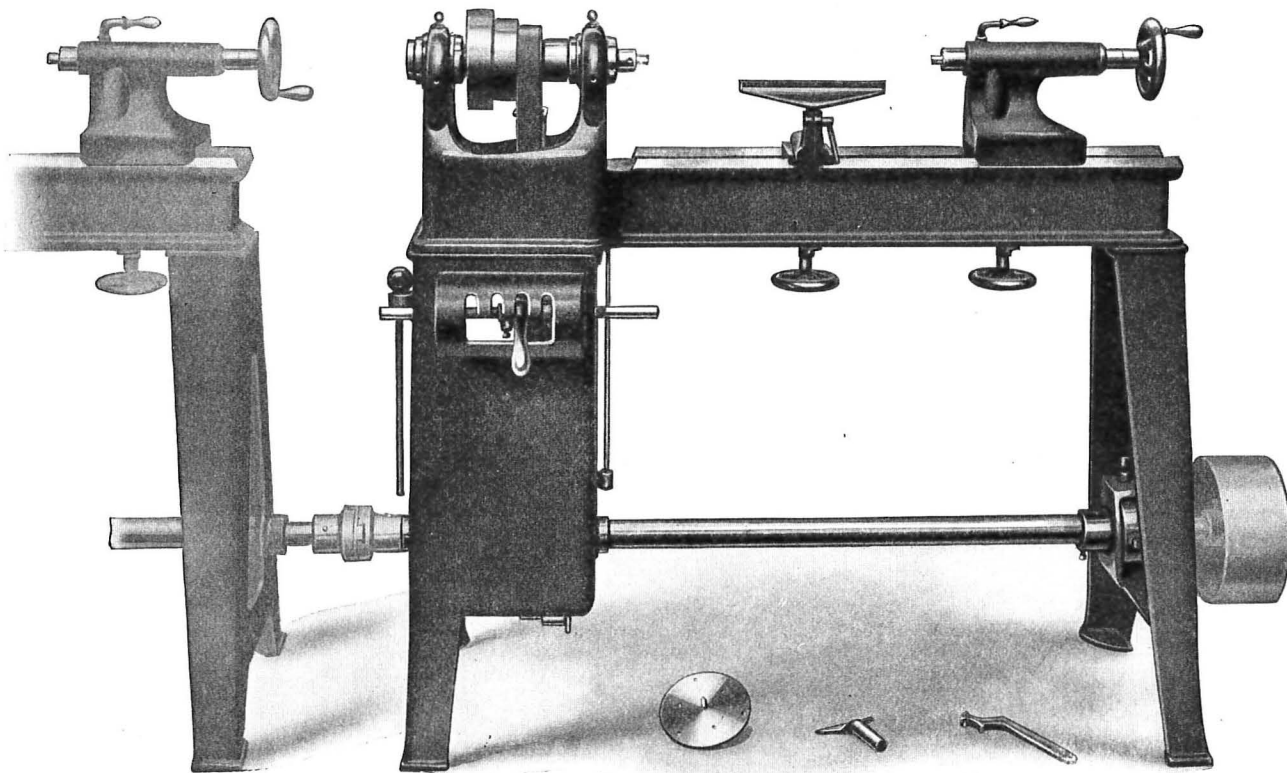
The material sold by the students included many embroidered and painted wares, decorated Christmas cards, menus and place cards. There were curtains, pillows, bedspreads, table runners and doilies galore. The present interest in knitting was recognized by the contribution of hundreds of embroidered knitting bags and baskets. So good was the technical standard of the work that the trade paper, "Women's Wear," devoted a special illustrated article to the sales, and said of the work displayed:

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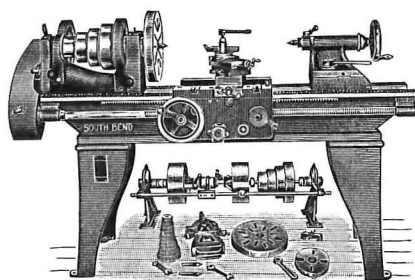
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### THE BOSTON MANUAL TRAINING CLUB MEETINGS.

#### The January Meeting.

The first meeting of the Boston Manual Training Club for the year 1918 took the form of a business luncheon-meeting and was held at the Architectural Club on January 12th. A decided treat was in store for the few members who braved the extreme cold to attend the meeting. After meal and the routine business had been transacted the entire club adjourned to the office of Dr. William Healy, near by.

Dr. Healy is the executive officer of the Judge Baker Foundation which has been effective in Boston in assisting the courts and school authorities in corrective work with boys. The foundation limits itself to cases which do not respond to the influences of ordinary school work. Dr. Healy described in an informal address, the detail methods that were used to test the mechanical and mental capabilities of boys who come under his observation. He outlined the plans and devices used in determining the types of work which these boys are capable of doing and of determining just what phases of the regular classwork are misapplied or are unsuited to the boys.

The Binet-Simon methods of testing mentality and several constructive or completion tests were described by the doctor at length. Many individual cases were cited as indicative of the accuracy of these tests. The results in many cases proved beyond the question of a doubt that boys under ordinary conditions must devote considerable time and attention to studies and types of work for which they have no inclination or fitness.

The members of the club present were privileged to witness demonstrations of the tests and were given ample evidence of the actual mental condition of the subjects as indicated by the tests. Several of the instructors present were also given an opportunity of trying out some of the tests used by the United States Army officers for the purpose of selecting young men for training as officers. Those present felt that the purpose and accomplishments of the Judge Baker Foundation were exceedingly worthy, interesting and helpful to those whose purpose is to direct boys into activities which shall react for their own best interests.

#### The Annual Get-Together Dinner.

The Annual Get-Together Dinner of the Club, which is the high point of the year's program, was held at the Architectural Club, December 15th, and took the nature of a patriotic meeting.

The one hundred members who were present wore patriotic headgear and joined enthusiastically in the patriotic program which followed the meal.

Not only to make the world safe for democracy, but to make democracy safe for the world—that is the tremendous task which confronts the American people, according to Dr. Payson Smith, commissioner of education for Massachusetts. Upon the manual training schools rests the heavy burden of constructive and re-constructive effort toward the attainment of this end.

England, Mr. Smith pointed out, permitted her educational system to relax under the stress of war conditions and the demands of industry for child labor, and today, with that system "in ruins almost as completely as Louvain," she has reaped the harvest of her folly in an increase of juvenile crime amounting to some fifty per cent. But in France this destruction of human raw material has been avoided by wise educational policies.

"I hope we of America will not make of this a children's war," added the speaker, significantly. "We must keep our standards up and assume the responsibility of training a future citizenship."

Mr. Smith pointed out in detail the necessity of keeping children in school and the great desirability of more teachers in training in the normal schools.

"A function of education in democracy" he said, "is to teach a broader conception of the meaning of democracy. It is not what democracy is going to do for me, but what I am going to do for democracy that counts in the long run. Again, the war has shown the weaknesses which exist and which must be corrected for the future. It is in the crises that the weaknesses are revealed in individuals or institutions. We need more physical training for the development of pupils, more teaching of thrift and the relative values of various phases of work, and the cultivation of straight thinking."

Pres. Edward C. Emerson, who acted as toastmaster, presented a preliminary report recommending the reorganization of school and shop procedure designed to serve the nation's needs and to benefit the pupils and the belief that the government would be willing to make use of school shop production, especially if the output were obtainable in large quantities thru the central agencies. The plan is undergoing review by government and military authorities.

Dr. Eugene A. Crockett, of Boston, who recently returned after three months' service with the Red Cross in Serbia, spoke

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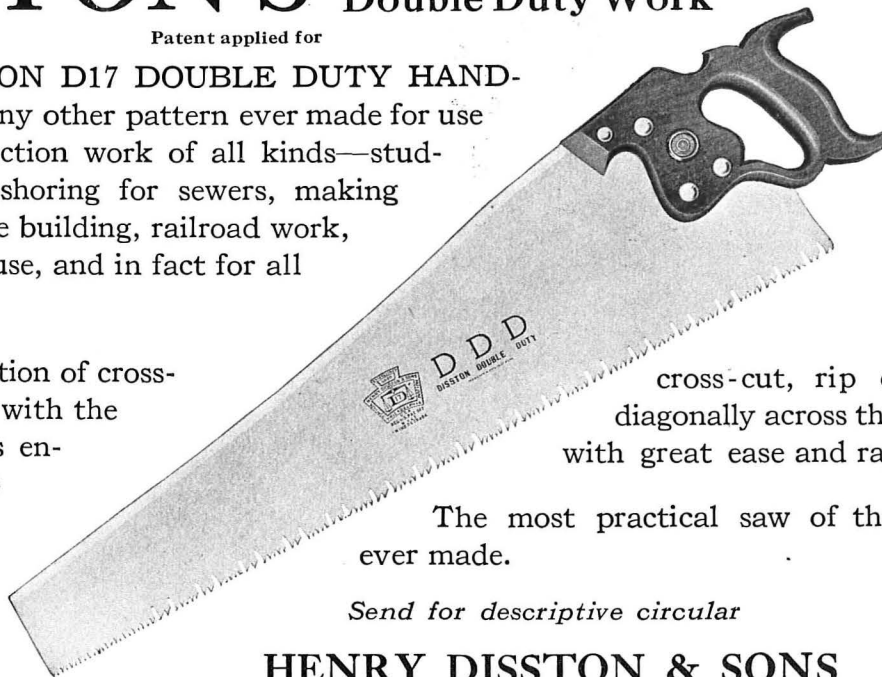
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on the subject, "Recent Experiences in Serbia." In the course of his remarks he gave it as his opinion that the war will continue for perhaps ten years. He said that the end might come suddenly thru a sudden collapse of one side or the other. Dr. Crockett pointed out that great political changes will be forthcoming after the war and that women will continue to hold the places they have attained in industrial life.

Dr. Willard Scott, in his address on "The Passion of Patriotism," painted a rare picture of boyhood in the old-time New England village. He described the parson and the teacher and dwelt lovingly on his first personal glimpse of Abraham Lincoln.

Mr. Ralph H. Gloag, a Boston attorney, described his experiences during a recent trip to Europe and he painted a vivid picture of a night's experience during a German air raid. He brought to the members of the club a most realistic idea of the horrors of the raids, even to the thousands who remained uninjured.

### Club Notes.

At the January meeting the following members were admitted to the Club:

*Active:* John Cox, instructor in sheetmetal working, Quincy Industrial School.

Arthur J. Mansfield, shop foreman, Boston Trade School, Boston.

Frederick E. Rau, shopwork instructor, Boston Public Schools.

Henry J. Tilton, shop foreman, Boston Trade School.

Elmer G. Whitmarsh, instructor in manual training, Melrose High School.

*Associate:* Albert W. Chilson, instructor in drawing, Lowell High School.

*Sustaining:* Jean L. E. Charrier, draftsman, Charlestown Navy Yard.

Many members of the club have volunteered for clerical service connected with government business in the city and are giving many hours weekly to the government in addition to maintaining their regular school work. The Department of Manual Arts of the Boston school system is a veritable beehive of industry and is devoting much time and attention to problems in which the interests of the government is served to advantage. Teachers and pupils alike are responding splendidly to the influences and suggestions of the department and the results are proving most gratifying.

In January the Co-operative Industrial Department of the Dorchester High School began the manufacture of several large cabinets for the new annex of the Hyde Park High School. When these are completed, the department will begin the construction of 35 large cabinet drafting tables for the same school. The department is in charge of Mr. Francis L. Bain.

The Boston Club maintains at Riverhurst, Billerica, a unique camp. The cottage, which is the center of the camp life, is located in the woods near Concord River and was erected by members of the club.

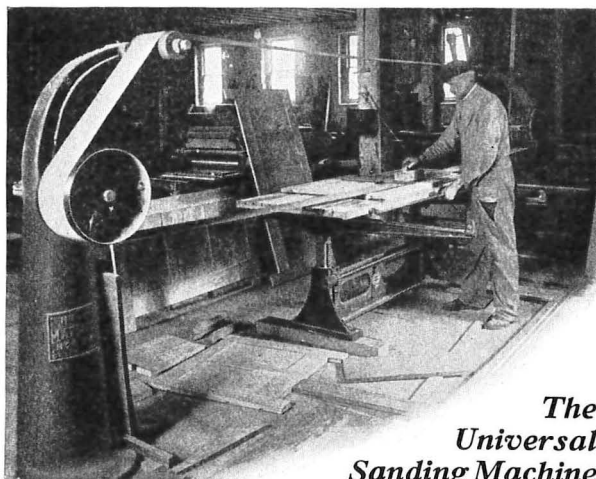
### THE DETROIT MANUAL TRAINING CLUB ROLL OF HONOR.

Norman Arthur, National Army.  
Wm. Bolt, Lieutenant, National Army.  
C. V. Fryklund, National Army.  
R. W. Horn, National Army.  
Clinton Morgan, Lieutenant, National Army.  
C. A. Picken, Lieutenant, National Army.  
Donald McQuire, Lieutenant, National Army.  
P. E. Thompson, Lieutenant, National Army.  
Percy F. Gifford, National Army.  
Geo. Guy, National Army.  
John White, National Army.  
Ralph E. Nyhus, in France.  
R. H. Gould, National Army.  
G. Steurwald, U. S. Aviation Corps.  
J. R. Paisley, National Army.  
L. H. Simpson, National Army.  
Francis Gottwald, National Army.

The Detroit Manual Training Club held its third bi-monthly meeting on January 11. The special program was devoted to a discussion of wood finishes and finishing. A technical description of the "Sources and Manufacture of Wood Finishes and their Application" was given by Mr. A. D. Hougg, manager of the Acme White Lead and Color Company. This paper was followed by a practical discussion of the preparation and application of wood stains and polishes in the classroom by Mr. B. Baym and Mr. A. M. Cornwell, members of the club.

Chicago, Ill. A school for women radio operators has been opened under the direction of an experienced woman operator.

Appleton, Wis. A class in telegraphy has been formed with an initial enrollment of 47 students.



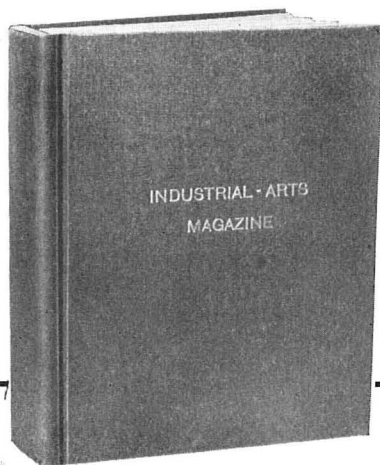
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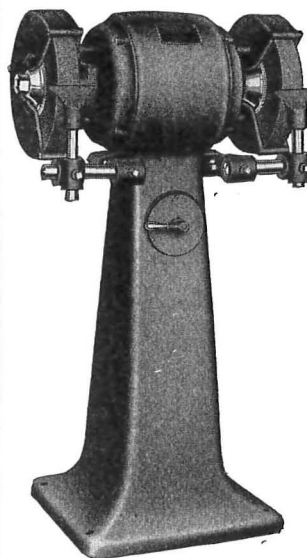
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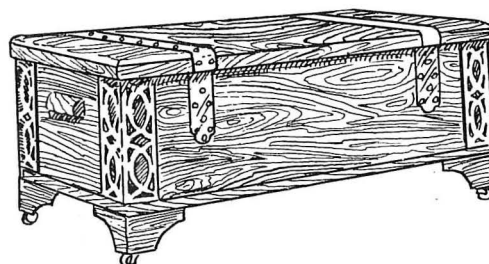
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## NEWS AND NOTES.

The Commission Council of New Orleans has given instructions to the city architect to prepare plans and specifications for the Delgado Central Trades School for Boys for which a legacy that amounts now to nearly a million dollars has been lying untouched for several years. The will of Isaac Delgado of New Orleans bequeathed the sum but as it provided only for the building of the school and the city was required to maintain it, the city had not been in position to assume the burden of maintaining the school on account of financial stress. It is not expected that the school will be built for some two years.

The two hundred and twelfth anniversary of the birth of Benjamin Franklin and, incidentally, the first anniversary of the founding of the Ben Franklin Club of East Technical High School, Cleveland, was celebrated during the week of Jan. 17th. Horace Carr, employing printer, who has studied the art in Germany, Belgium, Paris and London, and is recognized as an authority on the subject, gave an illustrated lecture on printing under the auspices of the organization.

The study of the biographies of Franklin, Washington and Lincoln, whose birthdays come in January and February, has been assigned to members of the club, all of whom take printing, by J. A. Webster, teacher of printing and faculty member of the organization. Boys have written short essays on these men and are printing them in pamphlet form.

To relieve the pressing need for grade school teachers of manual training a class to prepare high school boys to teach this subject will be formed next summer at East Technical or the Cleveland Normal School. About 40 boys have enrolled. The class will co-operate with J. E. Roberts, supervisor of manual training, and the six weeks of intensified training will take the place of the normal school training which the state law requires.

Supt. J. N. Adee, in his annual report to the board of education at Johnstown, Pa., outlines the proposed agricultural course for the schools. He recommends the employment of an expert agriculturist, the adoption of a complete course from the first grade thru the high school, and the provision of special plots for the Junior High School for use as gardens, fruit orchards and poultry yards.

In presenting the aim of agricultural instruction, Supt. Adee says: "I am not thinking particularly of making our children farmers and artisans, but inculcating in them habits of thrift, an appreciation of and sympathy with the life of the producer, what it means to be an intelligent consumer, a practical familiarization with objects about them—trees, plants, animals, hills, streams, rocks, the care of animals and plants and a knowledge of industrial processes; but in addition to all this thinkers, thru the interpretation of things they can see and handle. Dr. Flexner puts this last point well when he says: 'If the modern school is to be adequate to the need of modern life, this concrete training must produce sheer intellectual power. Abstract training has, perhaps, never before played so important a part in life as in this materialistic and scientific world of ours—the world of railroads, automobiles, wireless telegraphy and international relationships. Our problems involve, indeed, concrete data and present themselves in concrete forms; but back of the concrete details lie difficult and involved intellectual processes. Hence the realistic education we propose must evaluate in intellectual power.'"

State Supt. C. P. Cary of Wisconsin has recently opposed the housing of continuation schools in separate buildings. In speaking of a proposed continuation school for Madison, Mr. Cary said: "My advice to every city in Wisconsin is to avoid putting up separate and independent buildings for continuation schools.

"The question brings up in an acute way the results of the battle fought in the legislature last year," he continued. "The plan was then pointed out by the school men of the state as un-American in every sense, ill-advised and impossible. America is not ready for a peasant class of schools, or for separate and independent schools for the laboring classes.

"The city of Madison and every other city in the state had far better forego any state or national aid to their vocational or continuation schools than to make the absurd blunder of starting up two sets of schools, each competing for money and students."

At the recent meeting of the New York State Examinations Board a plan for eliminating all Regents' examinations in drawing in approved schools was endorsed and will go into effect September, 1918. Credit will hereafter be granted upon inspection of the regular work of the pupils and upon certificate of the principal. It will hereafter be possible in such schools to offer two, three and four-year courses in art without the handicap of an annual state examination breaking into the sequence.

The Division of Agricultural and Industrial Education of the University of the State of New York has to date organized

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about seventy war emergency courses to meet the needs of the war situation. For the present, Mr. Royal B. Farnum of that Division is spending a large share of his time in helping organize classes for shipbuilders on Staten Island.

A three-day short course in agriculture for teachers was held in January at the Lane Technical High School, Chicago. Instructors were taught the care and use of horses, milking, the care and use of farm machinery and other phases of farm management. The course was intended to prepare teachers for teaching agriculture to boys who will go to work on farms next spring.

Chicago, Ill. A continuation school for office boys employed in the loop district has been opened in the McClurg Building. The school aims to give boys a chance to complete their grammar school education and to receive diplomas at the end of the course. Attention is given to those subjects which will assist the student in his present occupation.

A course in jewelry manufacture has been begun at the Harrison Technical High School, Chicago. Thirty apprentices have been enrolled.

Iowa City, Ia. The students of the manual arts department made Christmas toys to the value of \$17.50 and sold them for the benefit of the Red Cross. The classes worked under the direction of Mr. J. Nevin Johnson.

The Art Alliance of America has arranged the following exhibitions at its galleries for the winter and spring months: January 22-31, second competition and exhibition of hand decorated textiles; February 13-18, graphic arts; March 13-28, jewelry; April 19-25, toys and containers; May 8-22, china and glass.

By reason of scarcity of draughtsmen in the business offices and industrial plants about Philadelphia, the board of education has since January 1 admitted women to the courses of architectural and mechanical drawing in the high schools. More than one hundred women are employed in draughting work in the city and it is expected that at least five hundred girls and young women will avail themselves of the new courses.

Free instruction in art is being given in the Chicago Academy of Fine Arts to high school students. It is intended to select and train such students as show aptitude for the fine arts.

The State of Rhode Island, thru the governor, has accepted

the provisions of the Smith-Hughes law for the establishment of vocational courses.

Lane Technical High School, Chicago, has inaugurated courses in breadmaking. Special attention is being given to the making of war bread.

Vocational schools are to be established at various points in the state of Wyoming in compliance with the provisions of the Smith-Hughes law.

Maryland will receive \$21,504 of the educational fund for vocational education.

The Federal Board for Vocational Education is planning to undertake the training of a quarter million drafted men in special lines of work before they are sent to the military camps. The men will be trained in a number of technical schools in a semi-military way. All schools selected for such work will be turned over to the army from May 1 to October 1.

Boys at the Arsenal Technical High School, Indianapolis, Ind., are being trained for war service on the farm. They will learn how to manage teams, how to milk cows, how to handle farming implements, care for live stock and select and grade seeds. The new course is intended to give practical instruction to boys who expect to go on farms during the summer vacation.

Illinois has been awarded \$93,772.25 for vocational education under the terms of the Smith-Hughes law.

A class in house and sign painting has been established at the East Technical High School, Cleveland, Ohio. The work has the approval of the local painters' association and the trade education committee of the Builders' Exchange.

A technical school for Alaskan natives is proposed at Metlakhtla, near Ketchikan. The school will offer instruction in carpentry, boatbuilding and engineering for boys and cooking, sewing and housekeeping for girls.

Free classes in farmwork are being held four nights a week at the Schurz High School, Chicago. The classes are for men and women and include instruction in soils and crops.

The technical and trade schools of Buffalo, N. Y., are performing a splendid service in training men for military service as radio and buzzer operators. It is planned to extend the scope of the schools to include all forms of mechanical work.

The annual painters' short course has been re-opened at Council Bluffs, Ia. The painters' short course is given by the State College at Ames and is recognized as a valuable agency for improvement of men in the trade. Starting with one course in 1914, the work has grown until six short courses are offered during the present winter. The plans for this year provide that one day shall be given to each room of the house and the proper decoration for the same.

Evidence is not lacking that girls are taking up manual arts work in the evening schools. The Lane Technical High School of Chicago reports that it has 101 girls who are taking up printing, woodworking, automobile mechanics and electrical engineering in evening classes.

To further the work of the vocational guidance committee of the Oakland Chamber of Commerce, labor unions, employers and mothers' clubs were asked to send representatives to attend the council which held a meeting during the early part of January. The committee has for its aim the cultivation of efficiency in the individual, assisting every worker to select the vocation for which he is best fitted. An industrial survey of the Bay Region has been begun to determine whether the vocations are of sufficient value to the pupils, the demands for workers, opportunities for advancement, earnings and environment.

A course in home economics has been added at the Louisville Girls' High School with the opening of the second semester.

The Manual Training Normal School of Pittsburg, Kans., offers a course in automobile mechanics for male students of the school. The students are taught to rebuild cars and to make repairs.

Astoria, Ore. A scheme of tool insurance is in operation in the manual training shop of the Astoria graded schools. Boys who break tools accidentally are not requested to pay for them. All of the boys in the classes pay one cent each month and from the fund thus created new saw blades, awls, plane caps, hammer handles, etc., are purchased to replace such as are broken or worn out. The plan has been found to teach valuable lessons in co-operation and in the theory of insurance.

French pastry, bread and other bakery wares were recently made by pupils of the Lane Technical High School of Chicago, at the formal opening of the school bakeshop. Friends and relatives of the pupils were treated to cakes fresh from the school's ovens.

The State Agricultural College at Fargo, N. D., has been designated as the special institution for the training of vocational teachers in North Dakota.

The printing department of the Richmond, Ind., high school has been organized on a vocational basis. The new work which began in February, consists chiefly of vocational work in printing for boys. One-half of the time is given to shopwork and one-half to technical and related work.

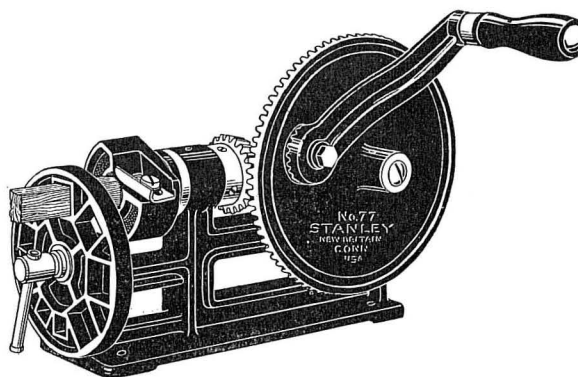
The Appleton (Wis.) Vocational School has added a course in paper manufacturing for the benefit of employes in paper mills. The work is given in both day and evening courses and includes academic work, chemistry and mechanical drawing.

Elmira, N. Y. A vocational school has been opened for boys who are industrially inclined, for those who desire to enter the industrial field and for those who wish to supplement a cultural education with a practical knowledge of industry. The school is divided into two departments, an intermediate department for boys who have completed the work of the sixth grade and a high school department for those who have completed the work of the intermediate department or who have graduated from the eighth grade. The latter is intended as a means for specializing in a skilled occupation and the classwork is cultural as well as adapted to the various industries taught. Three hours each day are devoted to bookwork and three to shopwork.

Shelbyville, Ind. A vocational agricultural course has been added in the high school for boys who expect to make farming their occupation, or who desire further education in subjects other than academic. A two-year course has been adopted for the present but later a four-year course will be offered so that graduates will have practically completed a regular high school course. Students will spend the forenoon of each day in the classroom and the afternoon will be occupied in home project work or helping with farm duties. Boys who desire to omit academic work are permitted to take agriculture and woodwork and then be dismissed for home work or work in the laboratory or shop.

San Jose, Cal. A course in French has been introduced at the evening school for the benefit of those who may go to France.

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## Elementary Manual Training

BY

EDWARD F. WORST

*Supervisor of Elementary Manual  
Training, Chicago*

(Complete Announcement in April Issue)

### WAR AND THE SCHOOLS.

*Free instruction* in radio and buzzer operating is being given at the high school, Binghamton, N. Y. The classes are open to men liable to be called in the draft.

*Special war dishes* were exhibited recently at the School of Domestic Arts and Science at Chicago. The exhibition was open to the public and housewives brought recipes for conservation dishes.

*Winter courses* in agriculture including instruction in practically every farm activity were offered to farmers in Ohio from January to March at the Ohio College of Agriculture. In addition to instructional work, forty lectures were given by experiment station workers and farm specialists.

*Boys* in the grammar schools of Buffalo, N. Y., are making knitting needles and shipping boxes for the Red Cross. The material for the boxes is furnished by the Red Cross and the work is done in the manual training shop.

*Pupils* in the Medina, Pa., schools have recently completed 54 comfort kits to be distributed to American soldiers.

*The carpentry class* in the Harrison Technical High School, Chicago, has been almost wiped out by the demands of the army and navy. Only one hundred students remain and not more than 150 are expected as additions from new classes.

*Of the 33 night schools* opened in Chicago, the greater number are utilized in training men for government service. The manufacture of munitions and ordnance are taught and a department of telegraphy has been opened to drafted men.

*The vocational division* of the War Department has selected Pittsburgh as the location for one of the government schools for the re-education of wounded soldiers.

*School facilities* of St. Louis and a number of other cities in Missouri are to be used for the vocational training of drafted men. The course opened in January and is to be completed by June 1.

*The Girls' Vocational High School* of Minneapolis, Minn., has completed one thousand army shirts. The work is done by paid workers who are being trained in the power machine classes of the school. The evening classes have undertaken the making of Red Cross and base hospital supplies.

*The Graeme Stewart School, Chicago*, turns out every two weeks, \$400 worth of supplies for the Red Cross. Four hundred children, two hundred of whom are boys, are knitting regularly.

*Schools* for the training of shipbuilders to meet the government's emergency need for skilled labor, are to be conducted by the State of New York in the school buildings of New York City. About 12,000 men are needed at the present time for work in the shipbuilding plants of the city.

*The vocational education* work for Ohio is to be put in operation immediately in order to help the government in building up a force of trained mechanics and technicians for the army. The following courses are proposed: Blacksmithing, concrete work, mechanical drafting, electrical trade work, foundry work, instrument repair work, leather work, machinist work, motor car and truck work, photography, pipe-fitting, sheet metal trade work, textile work, welding, woodworking, etc. Under many of these subjects there are as many as a half dozen different kinds of work, each a study in itself.

Only physically fit men will be allowed to receive this instruction. Equipment, class rooms and instructors will be furnished by the schools. Local classes will be organized in short unit courses, which will meet in the evenings, Saturday afternoons and in some cities on Sundays. In a number of necessary cases, government aid will be given the schools to enable them to put on this increased vocational training. There will be no tuition fee for the men.

*To hasten the shipbuilding program* a training center for instructors, who will serve as trainers of men in shipbuilding occupations, has been established at the Newport News Shipbuilding & Dry Dock Company under the direction of the Emergency Fleet Corporation. The industrial section is in charge of E. E. McNary, Charles R. Allen is local manager, and James E. Neary and H. C. Waugh are associate instructors.

*Sioux City, Ia.* Advanced courses in art metal work and automobile repairing are offered at the high school.

*St. Joseph, Mo.* The school board has offered the use of the school buildings and equipment to the government in training draft registrants for special branches of service. A six months' school will be conducted, with classes at night and on Saturdays and Sundays.



*Milwaukee, Wis.* The demand for telegraphy in the Boys' Technical High School has made necessary additional accommodations for the students. The total enrollment is 63 students, with ten in the day class and 53 in the evening class.

A *Red Cross Sale* was successfully conducted at Petoskey, Mich. The boys of the high school manual training department contributed a large quantity of handcraft furniture which had been made since the beginning of the school year. The collection represented an immense amount of work.

The *manual training department* of the La Salle School, Chicago, has made a specialty of knitting needles for socks which are supplied in quantities to the Red Cross.

*Franklin Institute*, Philadelphia, Pa., has opened a free school for the training of drafted men in radio and buzzer operating.

A school to train women and girls in wireless telegraphy has been opened by the Girls' League of Evanston, Ill.

A *gas engine school* has been successfully established by the United States Government at Columbia University, New York. The school has several hundred men who are being trained for engineering service on submarine chasers.

The *Lucy Flower Technical High School* of Chicago recently completed eighteen semi-tailored lined coats for civilian relief work of the Red Cross. The entire work, including the button-holes, was done by the girls pursuing the two-year vocational course in sewing.

An *evening class* in telegraphy has been formed in the Vocational School of Beloit, Wis. The class has been in operation for a number of weeks and is doing very satisfactory work.

The *teachers and pupils* in the schools of Minneapolis have undertaken Red Cross work of various kinds. Teachers have entered the classes in the machine knitting department and in surgical dressings. The school people in general have responded well to every appeal and activity which the war has made necessary. In the recent Red Cross membership drive, 1,985 memberships were taken with a total of \$2,132 in subscriptions.

The children have taken out thrift savings stamps and war savings certificates.

#### PERSONAL NEWS NOTES.

*Mr. W. M. Todd*, who has had charge of the manual training department of Osage, Iowa, during the past six years, has resigned to become director of manual training at Anacortes, Wash. Mr. Todd assumed his new position January 2.

*Mr. C. G. Wenzel* has been appointed acting director of manual training in the public schools of Kalamazoo, Mich. Mr. Glenn Mayer, a graduate of the Teachers College, Columbia University, has been added to the teaching staff of the Michigan Western State Normal School, and Mr. Marion Sherwood has been granted a leave of absence to do special work at the Teachers College. Mr. Wenzel fills the position formerly held by Mr. George S. Waite.

*Mr. Harry Vincent*, who has been connected with the Duluth Central High School, has resigned to accept a position with the Franklin Junior High School, at Minneapolis.

*Mr. George R. Carr*, instructor of manual training at the National Junior Republic, Annapolis Junction, Md., has resigned to accept a position at the Uniontown, Pa., High School. Mr. Carr has had six years' experience as teacher of manual training in the grammar schools of Buffalo, N. Y.

*Mr. R. V. Rickcord*, formerly instructor in the Rochester Shop School, and later efficiency engineer for Ide Collar Company of Troy, has recently been appointed to the Division of Agricultural and Industrial Education of the University of the State of New York, to aid in organizing the war emergency courses.

*Mr. Royal B. Farnum*, State Specialist in Art Education for the State of New York, has been appointed Director of the Chautauqua Summer School of Arts and Crafts.

*Arthur J. McDonnell*, of Buffalo, N. Y., has been appointed field inspector in the department of vocational training under the New York Military Commission. Mr. McDonnell will have charge of the work among boys from 16 to 19 years of age who are in school. He will also have charge of the farm cadet work.

*Claude J. Merchant*, principal of the Elmira Vocational School, Elmira, N. Y., has been appointed as instructor for the Emergency Fleet Corporation at Newport News, Va.

*John A. Lapp*, who has been director of the Indiana Bureau of Legislative Information since 1908, has been appointed director of investigation of the Ohio state health and old age insurance work.



# Printing

## as a method of teaching

# Spelling

SPELLING is largely a matter of memory: either eye-memory or ear-memory. Eye-memory is better than ear-memory. In fact, in the study of homonyms it is essential that the pupil possess eye-memory. Such homonyms as beat, beet; heel, heal; stake, steak, are usually confused when the pupil studies spelling by the sense of hearing: never does such confusion exist when spelling is learned by seeing the words in **printed** form.

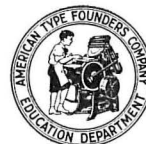
Printing, being more concise and legible, has many advantages over writing in the teaching of spelling.

In order to show the advantages of printing over writing when teaching spelling, a comparison of the following columns is all that is necessary:

<i>type</i>	type
<i>impression</i>	impression
<i>separate</i>	separate
<i>presswork</i>	presswork

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*Miss Eleanora Herzsche*, head of the cooking department of the Columbus High School, has resigned to become director of the manual training high school at Indianapolis, Ind.

*W. C. Kilvington*, who has been superintendent of the Tennessee Industrial School at Nashville, since its establishment in 1886, has resigned after a service of 31 years. Mr. Kilvington is succeeded by *J. H. Bayer*, of Huntingdon.

*J. D. Elliff*, of the University of Missouri, has been named director of vocational education for the state.

*Ralph Johnson* has resigned as head of the manual training department at Vineland, N. J. Mr. Jacob Pennino succeeds him as director.

*Edward T. Welsh*, head of the printing department of the Elm Vocational School, Buffalo, N. Y., has resigned to become manager of the Rochester Bureau of Printing.

*C. A. Fulmer*, of University Place, Neb., has been appointed Director of Vocational Education for Nebraska.

*Wilbur H. Bender*, of the Agricultural College of the University of Minnesota, has been appointed Director of Vocational Education for Iowa.

*W. F. Shaw*, instructor at Bowling Green Normal School, has been appointed Director of Vocational Education in Ohio.

*Francis Kirkham*, of Salt Lake City, has been selected to supervise the work in vocational education for the State of Utah.

*J. H. Gill*, formerly director of the Columbus Trade School, Columbus, O., has been appointed by the Federal Board of Vocational Education, supervisor of vocational education for drafted men.

*Mr. James R. Coxen*, who organized the manual training work in the new Southwest Texas State Normal School, at San Marcos, has resigned and has been appointed director of vocational education for Wyoming. Mr. Coxen will have entire charge of the organization and administration of the vocational work to be undertaken in the schools of Wyoming under the provisions of the Smith-Hughes Act. Mr. Coxen will work closely with the University of Wyoming and will direct the training of industrial teachers for the state.

*John J. Swan*, for four years instructor in manual training at Williamsport, Pa., has resigned to enter the service of the government at Philadelphia.



#### THE HONOR ROLL OF NEW JERSEY.

Thru the courtesy of Dr. E. A. Reuther, assistant in industrial education for the New Jersey State Department of Public Instruction, the *Industrial-Arts Magazine* is enabled to publish below the honor roll of manual training and vocational teachers of New Jersey who have entered the Federal Service for the period of the war.

*J. R. Bowen*, Atlantic City, N. J., U. S. Aviation Corps.

*Ralph D. Gillette*, Atlantic City, N. J., U. S. Aviation Corps.

*Frank Reagle*, Dumont, N. J., Corporal, Co. A, 107th Reg.

*Raymond Conners*, Lodi, N. J., National Army.

*Nelson Voorhees*, Camden, N. J., Camp Dix, Pa.

*Arthur B. Brown*, Camden, N. J., National Army.

*Arthur N. Myers*, Bridgeton, N. J., National Army.

*Wilbur Demarest*, Montclair, N. J., Corporal, 110th Co., Bat. E, Anniston, Ala.

*W. H. O'Dell*, Montclair, N. J., National Army.

*W. H. Stockwell*, Montclair, N. J., U. S. Aviation Corps.

*Irvin S. Wells*, Montclair, N. J., U. S. Aviation Corps.

*Albert J. Mory*, Irvington, N. J., Private, 21st Engineers Corps.

*Oscar F. Raab*, Newark, N. J., National Army.

*Geo. D. Cronan*, Newark, N. J., National Army.

*Sam B. Ashmead*, Newark, N. J., National Army.

*George Frank*, Newark, N. J., U. S. Aviation Corps.

*James E. Dougan*, Newark, N. J., U. S. Shipbuilding Corps.

*Margery A. Lyon*, Newark, N. J., U. S. Hospital-Dietetics.

*W. H. Merriam*, Newark, N. J., National Army.

*Samuel Horwitz*, Bayonne, N. J., 1st Lieut., Gen'l Engineers Corps.

*F. W. Gleisner*, West Hoboken, N. J., U. S. Aviation Corps.

Robert S. Grosch, Trenton, N. J., Private, Co. E, 311th Inf.  
C. E. Parsil, New Brunswick, N. J., U. S. Shipbuilding  
Corps.

Herbert B. Rankin, Perth Amboy, N. J., 1st Inf. Reserve,  
Officers Training Camp.

Oliver Holmes, Perth Amboy, N. J., Sergeant 311th Reg.,  
Co. G.

Geo. Seaman, Perth Amboy, N. J., Corporal, 2nd Reg.,  
Field Artillery.

Wm. J. Barry, Asbury Park, N. J., U. S. Aviation Corps.  
Jas. F. Mason, Paterson, N. J., Engineers Corps, U. S.

Naval Reserve.  
Geo. J. Doherty, Paterson, N. J., U. S. Navy.

Frederick Weaver, Passaic, N. J., Private, Co. F., 101st Reg.  
Claude V. Gayton, Summit, N. J., U. S. Aviation Corps.

Karl E. Bassett, Elizabeth, N. J., Ordnance Dept., U. S.  
Army.

Thos. W. Hopkins, Elizabeth, N. J., Ordnance Dept., U. S.  
Army.

Percival Pulsifer, Union Township, N. J., U. S. Aviation  
Corps.

Donald Hutson, Union Township, N. J., U. S. Inf. Corps.  
Charles Horn, Summit, N. J., Ordnance Dept., U. S. Army.

Clarence Shubert, Plainfield, N. J., National Army.  
Bernard Wiest, Chicago, Ill., National Army.

John Black, Dorchester, Mass., U. S. Navy.  
Mr. Irving J. Rosbeek, Chicopee Falls, Mass., U. S. En-

gineering Corps, National Army.  
Mr. Loren J. Berry, Waterloo, Ia., in France.

Orian F. Dhein, Madison, Wis., U. S. Aviation Corps,  
Austin, Tex.

H. H. McCartney, Draper, Utah, Camp Lewis, American  
Lake, Wash.

Paul H. Brown, Topeka, Kans., U. S. Navy.  
Paul Amort, Pendleton, Ore., Officers' Training Camp,

American Lake, Wash.  
Philip Parcher, Pendleton, Ore., War Department, Washing-

ton, D. C.  
Arthur E. Turner, Enterprise, Ore., Aviation Corps, Pensa-

cola, Fla.  
Claude J. Merchant, Elmira, N. Y., U. S. Shipping Board,

Newport News, Va.  
Alfred H. Bingham, Buffalo, N. Y., U. S. Army.

Arthur J. McDonnell, Buffalo, N. Y., New York State  
Military Commission on Vocational Training.

R. E. Lawton, Winchester, Ky., Aviation Corps.  
Mr. Glen Crosby, Rock Island, Ill., in France.

Mr. D. E. Chenault, El Paso, Tex., Motor Co. 6, 315th  
Supply Train, Camp Ironis, Tex.

Mr. Lee Dunlap, Ionia, Ia., Training Camp, Camp Dodge,  
Iowa.

Mr. P. H. Brown, Topeka, Kans., U. S. Navy.  
G. K. Flagder, Royce City, Tex., Supply Comp. 359th Inf.,

Camp Travis.  
J. Thomas Bell, supervisor of manual training, Norfolk,

Va., U. S. Naval Base, Cherrystone Island, Cape Charles, Va.  
A. L. Langer, Menominee, Mich., U. S. Forestry Service,

Escanaba, Mich.  
John Hedgcock, Memoninee, Mich., U. S. Forestry Service,

Escanaba, Mich.  
Prof. Smith, Memoninee, Mich., U. S. Forestry Service,

Escanaba, Mich.  
Myron J. Edwards, Amarillo, Tex., 30th Engineers Corps,

Washington, D. C.

C. L. Merrill has been appointed instructor in manual train-  
ing at Tonawanda, N. Y.

At the recent meeting of the New York Teachers' Associa-  
tion, Mr. Harry W. Jacobs, of Buffalo, was elected president of  
the fine, industrial and household arts sections. Stewart F.  
Ball, of Buffalo, Miss H. A. Perrine, of Albany, and Miss Van  
Looe, of Albany, were elected vice-presidents.

H. L. Deits, teacher of manual training at the Lincoln High  
School, Seattle, Wash., has been appointed head of the depart-  
ment, succeeding H. W. Mulholland.

F. W. Holt has been appointed head of the shop department  
of the Technical High School, Atlanta, Ga. Mr. Holt succeeds  
C. A. Deane.

C. R. Frazier, superintendent of schools at Everett, Wash.,  
has been appointed director of vocational education for the state  
of Washington.

Wm. F. Boyd, instructor in manual training at Hastings,  
Mich., has been drafted into the National Army. Mr. Boyd's  
successor is Harvey C. Currey, of Kalamazoo.

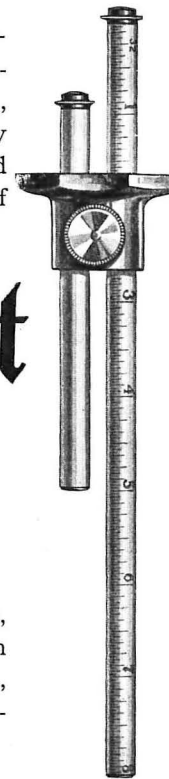
Paul Amort and Philip Parcher, instructors in manual train-  
ing in the high school, Pendleton, Ore., have enlisted in the  
Navy.

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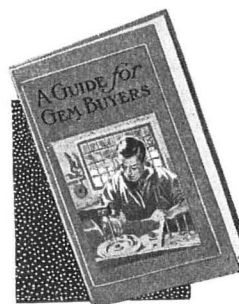
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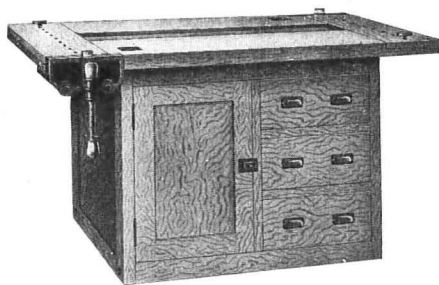
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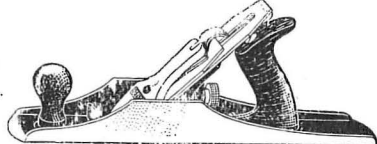
We represent some of the biggest tool manufacturers  
in the United States today. *Prompt service on large  
or small orders. That's our slogan.*

*Write for prices and information.*

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## MANUAL TRAINING School Equipment Benches, Tools, Supplies Jewelers' Tools and Supplies

We are sole agents for the Rose Hammers  
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in the complete Tool Outfitting of Manual  
Training Schools.

Send for our new illustrated Catalogue and allow us  
to quote you on your requirements.

**BELCHER & LOOMIS HARDWARE CO.**

PROVIDENCE, RHODE ISLAND

To Settle an Estate We Will  
**SELL AT ONCE, FOR CASH**  
 COMPLETELY EQUIPPED  
**JEWELRY PLANT**  
 FOR MAKING ARTS AND CRAFT JEWELRY

Right here in the world's center of the jewelry industry. All tools and necessary machinery for making excellent craft jewelry of every description, including some of the largest department stores in America.

Purchaser may take immediate possession and start producing at once.

If you desire to enter business, have good taste and ideas, you will hardly find a more congenial opportunity.

The necessity of immediate sale makes the price exceedingly attractive.

Craft jewelry is more in demand each year as the public taste is educated more and more to the charm of simple artistic effects in personal adornment.

This may be the very opportunity you have waited for. We urge immediate action if you are interested.

If within reasonable distance of Providence, call in person—if not, write at once for full details.

Address

**LEON H. FOLLETT, 605 Union Trust Building, Providence, R. I.**

## NEWS OF THE MANUFACTURERS

### A CARBORUNDUM CATALOG.

The average man hardly has a conception of the multiplicity of products required in our preparations for war and in the actual conduct of the war itself. A recent announcement of the Carborundum Company will give a clue to the vital necessity of just one item—grinding devices—and will make clear that practically the entire range of products and devices known to humanity enter into the destructive art of war. Writes the Carborundum Company:

"Carborundum and Aloxite products are doing their bit. They are grinding shrapnel shells, high-explosive shells, rifle barrels and parts—grinding bayonets and sabers. They are grinding a hundred and one different parts of the aeroplane and the auto truck, the machine gun and the field gun. They are shaping plate and grinding car wheels; grinding plowshares and the tools of the metal-working trades of the world. They are grinding torpedo tubes and torpedoes, grinding submarine engine bases; beveling the lenses of periscopes and buffing the soles of the army shoes and grinding the shears for the pocket kits of the 'Sammies.' They are doing a thousand and one war tasks quicker and better than they have ever been done before."

While the manual training teacher has not so wide a use for carborundum products, he still has need of a variety of grinding and polishing and he will therefore be interested in the latest reprint of the carborundum catalog. The booklet presents in very condensed form, a surprising number and variety of articles and will be sent to any reader of the *Magazine* upon request.

### NEW STANLEY DOWEL AND ROD TURNING MACHINE.

Stanley Rule and Level Company has just put on the market a dowel and rod turning machine that will be appreciated by supervisors and instructors of cabinet making and pattern making.

Every shop instructor has experienced the difficulty of obtaining dowels of exactly the correct dimensions, especially in emergency situations. The right size and the right length are very rarely on hand for a special piece of work.

The new Stanley Dowel Cap will make dowels from  $\frac{1}{4}$  to  $\frac{3}{4}$  inches in size and cutter heads may be had for  $\frac{3}{8}$ ,  $\frac{5}{16}$ ,  $\frac{7}{16}$ ,  $\frac{1}{2}$ ,  $\frac{9}{16}$ ,  $\frac{5}{8}$ , and  $\frac{11}{16}$ . The machine will cut any waste stock with remarkable rapidity and ease.

A complete circular describing the tool has been prepared and will be sent to readers of the *Magazine* on request to the firm at New Britain, Conn.

### ISSUE NEW ART SERIES.

Atkinson, Mentzer & Company, Chicago, have announced the early publication of a new series of drawing books under the title of "Industrial and Applied Arts Books." The books are edited by Mr. Elmer E. Bush and Mrs. Florence Reid Bush, assisted by an advisory committee of four prominent art experts.

### ALBERT AGENCY MOVES.

The Albert Teachers' Agency has recently removed its office from 623 So. Wabash Avenue, Chicago, where it was located during a period of fifteen years, to 25 E. Jackson Blvd. The new location is located in the Kimball Building, a splendid modern office structure between Wabash Avenue and State Street.

The Albert Agency has greatly extended its activities during the past two years, and has recently established branch offices at 437 Fifth Avenue, New York City, under the management of Mr. S. A. MacKenzie, Spokane, Wash.

### LUMBER SAMPLES.

Schools may obtain samples of thirty important woods for display in manual training shops thru their local lumber dealers.

The National Lumber Manufacturers' Association, thru its trade extension committee, has prepared thirty samples of the more important woods and is supplying them at less than cost to lumber dealers who want them either for office displays or to present to local manual training schools.

Each wood sample is  $2\frac{1}{2}$  by 5 inches, shellaced and labeled with the common and scientific name. The woods shown are white ash, beech, basswood, chestnut, western red cedar, cypress, white elm, Douglas fir, red gum, eastern hemlock, western hemlock, tamarack, western larch, maple, white oak, red oak, northern white pine, western white pine, western pine, Arkansas soft pine, sugar pine, southern yellow pine, North Carolina pine, Norway pine, yellow poplar, redwood, Sitka spruce, tupelo and black walnut.

(Continued on Page XXXI)



"SIGNED LUMBER  
IS SAFE LUMBER"

FOR BEST LUMBER INSIST ON  
TRADE-MARKED "TIDE-WATER"

**CYPRESS**

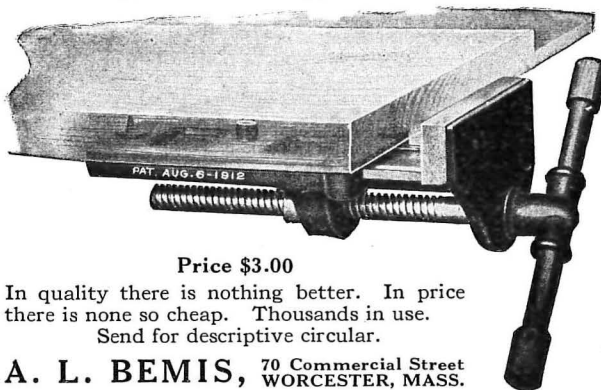
LUMBER—BECAUSE IT'S "THE  
GENUINE WOOD ETERNAL"  
& LASTS & LASTS & LASTS & LASTS

Look for this on every board—

Accept no Cypress without this mark.



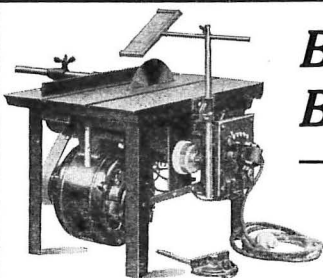
## THE BEMIS STANDARD VISE



Price \$3.00

In quality there is nothing better. In price  
there is none so cheap. Thousands in use.  
Send for descriptive circular.

A. L. BEMIS, 70 Commercial Street  
WORCESTER, MASS.



## Ball Bearing Bench Saw

—MOTOR DRIVEN—

Convenient, Durable,  
Efficient.

Made in several styles for both wood and metal saw-  
ing, and adapted to all classes of work. Saws two  
inch stock with ease. Attached to any lighting circuit  
—no special wiring required.

Details and prices sent upon request.

H. G. CRANE, Manufacturer  
BROOKLINE, MASS.

## FRAIN LUMBER

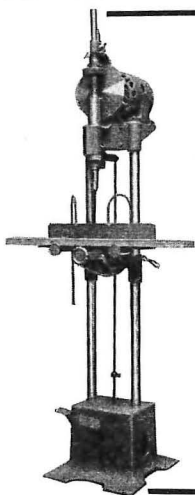
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Manual Training and  
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are coming in from users of these Electric  
Mortisers and Boring Machines. Quick,  
Accurate, Easy to operate and Inex-  
pensive—these are the good reasons for  
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**Superior Electric Mortisers**  
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Made in three styles for both Motor and Belt  
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FREE TRIAL

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**Warning!**—The average Machinists'  
Hammer is too hard for the student.

We make on special order a "Half-Temper"  
Hammer for Manual Training use.

Write for complete information.



We make all patterns of Hammers.

Write for Complete Catalogue.

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## A Vast Industry Is Printing

Printing has for years been the sixth great business of the  
United States; it is now the fifth, perhaps the fourth in  
volume. In importance it is the first. A youth who  
acquires knowledge of the Printers' Art and Practice is well  
educated—educated in the best way; his hand, eye, brain and  
habits are splendidly trained. He has acquired a trade; he has  
a grip on business and world affairs; he has what will make him  
more valuable and efficient in any line of business he takes up

The printing office is an essential part of school work and training  
Thousands of schools have tested it; everyone approves and prizes it  
We furnish estimates, outfits and help. Call on us

**Barnhart Brothers & Spindler**

Chicago Washington, D. C. Dallas Saint Louis  
Kansas City Omaha Saint Paul Seattle

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## RED GUM

"THE LOVELIEST CABINET WOOD  
IN ALL THE WORLD."

NATIVE TO AMERICA. PLENTIFUL.  
BEAUTIFUL. WORKABLE. TRY IT.

## RED GUM

**Gum Lumber Manufacturers Ass'n.**

1315 Bank of Commerce Bldg.

Memphis, Tenn.

**DISSTON'S NEW HAND SAW.**

It is conceded that the most important tools in a carpenter's kit are his hand saws—one for crosscutting, the other for ripping. These are absolute essentials for general work, practice having determined that each must be individually constructed, so far as the teeth are concerned, for the particular class of work it is to perform. While this applies to carpenter work, in these days of general work, concrete building operation, factories, bridges, etc., there is so much lumber used for forms and uprights that notwithstanding the employment of a portable circular sawing outfit, considerable hand saw work is entailed.

The work required of a hand saw is not so much for a smooth cut as for quick cutting and partakes of both crosscutting and ripping, the lumber mostly used being North Carolina pine boards. It will readily be seen that in the use of two saws for the work, a rip and a crosscut, considerable time is lost during the day in picking up one, then the other, again either the rip or the crosscut saw may not be at hand, and further, neither of these give the highest results in sawing at an angle. A single style of saw, with teeth specially adapted for this combination of work, giving quick action with minimum labor and having a form of teeth easily kept in order, has advantages which are readily appreciated.

The Disston Double Duty saw now being made and marketed by Henry Disston & Sons, Philadelphia, excels any other pattern of saw put on the market for use in general construction work of all kinds, including studding up houses, shoring for sewers, forms for concrete buildings, railroad work, millwrighting, farm use, etc. To make sure of its adaptability to special work, sample saws were made and distributed among carpenters on concrete work. Numerous tests have demonstrated beyond doubt the practical utility of the saw and its advantages over the regular patterns for the work required. The tooth-edge consists of a special combination of rip and crosscut teeth, each section separated by a deep gullet. In crosscutting, the rip teeth act as cleaners, clearing out the kerf. In ripping, there is a double action, the crosscut teeth making a scoring cut on each side of the kerf, which enables the teeth to cut clean with greater ease and rapidity, not only in ripping but in cutting on an angle across the grain. The saw is made in skewback pattern, the blade of Disston high-quality steel, warranted, and the handle of hardwood, polished and fastened with brass screws. It is made in 26-inch length.

Information concerning the Disston Double Duty saw may be had by addressing Henry Disston & Sons at Philadelphia, Pa.

**IMPROVE MILLING MACHINE.****Oliver Company Increases Capacity of Popular Machine.**

Important changes in the design of the "Oliver No. 75" wood milling machine have been announced by the Oliver Machinery Company, Grand Rapids, in a recent circular. The improvements are in the direction of broadening the utility and capacity of the machine.

The design of the main column of the machine has been broadened and the base has been enlarged so as to render it practically free from vibration and to make it materially heavier and more substantial.

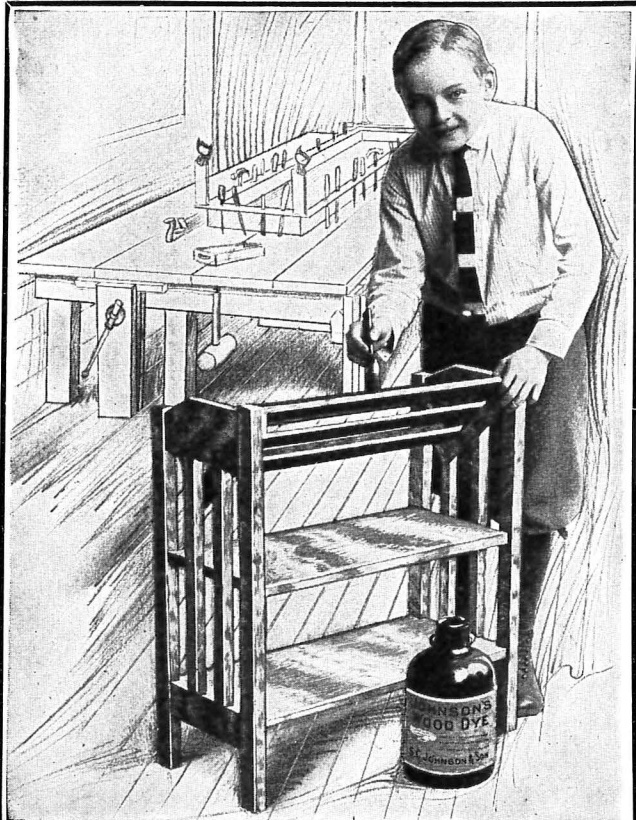
The chief change, however, is in the design and construction of the table. The table in the original machine could be tilted 45° in either direction and rotated in a horizontal plane. In the new table the compound cross slides are located above the double swivel and tilting mechanism so that the compound slides will operate in any position. The table may thus be rotated in a plane at any angle. The weight of the supporting counter has been increased and the arm for supporting the table has been lengthened. Thruout, the machine has been strengthened without increasing its weight or necessary power consumption beyond economical use in the school shop and small patternshop.

The Oliver Machinery Company will be pleased to send full information and prices to any reader of the Magazine who addresses the home office in Grand Rapids, Mich.

*Mr. Louis M. Roehl*, who has been in charge of the classes in woodworking at the Milwaukee County School of Agriculture, has become instructor in the teacher training department of the New York State College of Agriculture (Cornell University), Ithaca, N. Y. *Mr. Roehl* will have charge of the classes in preparing teachers of manual training for rural high schools for New York City.

*Mr. Gerald A. Boate*, who was formerly connected with the industrial department of the Newtonville, Massachusetts, schools, has become officer in charge of industrial surveys for the Canadian Military Hospitals Commission, Ottawa.

*Mr. George S. Waite*, who was director of manual training at Kalamazoo for many years, has become connected with the Santa Barbara (Cal.) State Normal School of Manual Arts and Home Economics.

**Every Amateur Craftsman**

has experienced the disappointment of having a beautiful piece of furniture—one on which he has spent many hours—spoiled with improper finishing. Johnson's Wood Dye and Prepared Wax are especially adapted for furniture work—they are being used in many of the finest furniture factories in the country. The most inexperienced can use Johnson's Wood Dye and Prepared Wax successfully.

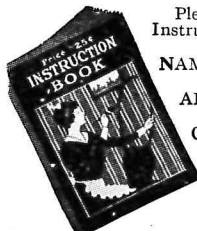
**Johnson's Wood Dye**

is the best stain to use for coloring the wood. It goes on easily, without a lap or a streak—penetrates the wood without raising the grain—is made in 14 standard shades. Johnson's Wood Dye is unequalled for staining reed and wicker baskets.

**Johnson's Prepared Wax**

is the proper finish to use over the Dye. It imparts a hard, velvety finish of great beauty and durability. It is impervious to water, dust, scratches, finger prints, etc. The finish obtained is sanitary, durable and beautiful.

Send this coupon for the new Instruction Book telling how to finish new work and refinish old work.



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"The Wood Finishing Authorities"  
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THE mere specification of "Saws" doesn't assure you that these important tools will give the best service. Buy Saws that earn their way, paying dividends of satisfaction and perfect service in the hands of both novice and artisan.

ATKINS SILVER STEEL SAWS are Quality from "stem to stern." The finest steel and careful workmanship have standardized them as reliable tools for up-to-date shop equipment.

Before placing your order—investigate. Find what ATKINS SILVER STEEL SAWS are and why it's

***"Atkins Always Ahead"***

Our 1918 Manual Training Catalog carries complete explanation and details.

**E. C. ATKINS & CO., Inc.**  
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